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Faculty of Behavioural, Management and Social Sciences

Hindering and Promoting Factors of Data Based Decision Making in Dutch Primary Schools

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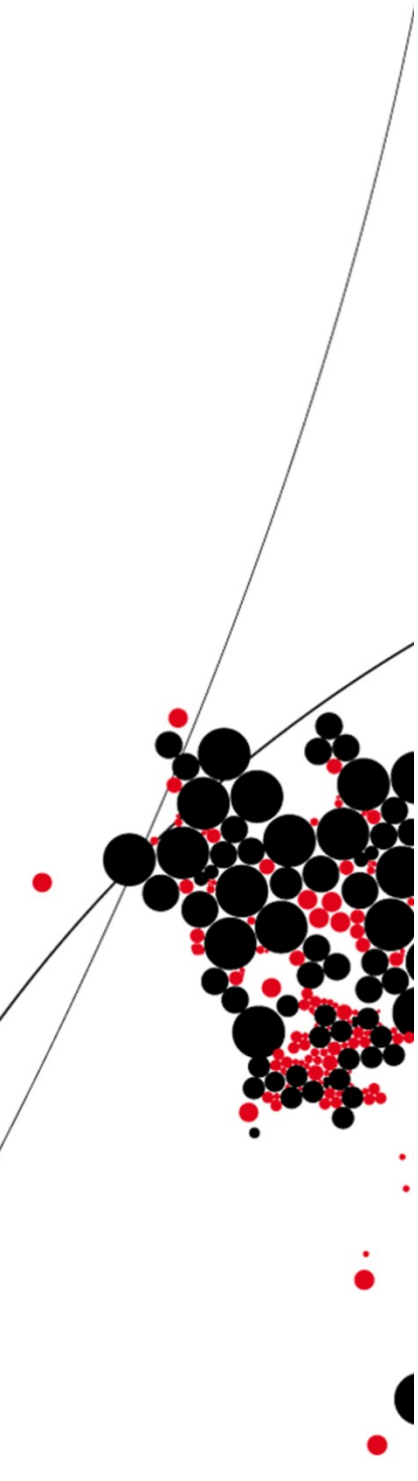

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Foreword

This thesis is the result of the research I have conducted to finalize the master Educational Science and Technology at the University of Twente. An evaluative study was performed to analyze and gain insight into the 'hindering and promoting factors for Data- Based Decision Making in Dutch primary schools'. Hopefully, the insights from this research contribute to the improvement of implementing Data Based Decision Making in Dutch primary schools and will contribute to the field of Educational Science.

Writing this master thesis has been a great learning experience that had various ups and downs. At this moment, the end of this study and the writing of the master thesis, I can say that I am really proud of this final product and the process I have been through.

Therefore, I would like to thank a few people that supported me, and guided me through the entire process. First of all, I would like to thank my supervisor prof. A.J. Visscher for being patient with me and providing me with feedback and good communication about the thesis.

Secondly, I would like to thank Eva Blokhuis and Niek Moonen for reading my thesis and providing me with extra feedback on my master thesis so that I could further improve my thesis.

Last but not least, I would like to thank Thijs Oude Luttikhuis for his never-ending support during my entire study and his trust in me that I would make it to the end, even when I doubted myself.

It was a hard, inspiring, and interesting learning experience of which I am glad it is over, but I also know it is a valuable life lesson.

Joyce van Baaren
Almelo, 2018

Abstract

This research is focused on the factors influencing the implementation of Data Based Decision Making (DBDM) in Dutch primary schools. Incentive for this research is the relatively low performance of Dutch students on linguistic and mathematical skills in comparison to international students. The Dutch ministry of Education, Culture and Science has made the improvement of linguistic and mathematical skills one of its key goals. Therefore DBDM is now a core theme in Dutch educational policy. DBDM can improve the performance of students, however previous research has shown variation in the effects of DBDM between schools and it is not clear which are the factors that matter here. Therefore, this study investigated the factors influencing DBDM.

First of all, a literature study was conducted to determine hindering or promoting factors for DBDM mentioned in the scientific literature

Secondly, interviews based on the "storyline method" were held with school leaders and trainers who participated in the 'Focus DBDM-project' that was initiated by the University of Twente. Based on the literature the empirical data were divided into categories. New categories were created for influencing factors that could not be assigned to one of the categories found in the literature.

As a result of the analysis of the qualitative data from the interviews, this study reveals more insight into factors that either are hindering or promoting DBDM in Dutch primary schools. Analysis focused on the factors that were found in literature showed that features of both, teachers as well as school leaders were seen as factors that influenced DBDM during the Focus intervention. The extent to which a school leader showed instructional leadership influenced DBDM. And the attitude of teachers was a factor that determined its promoting or hindering effect.

The analysis of the interviews also revealed other 'unknown' DBDM influencing factors. The factor that was mentioned significantly the most was the factor 'school team'. It turned out that the stability of the school team influences DBDM. A stable school team has a promoting effect and a varying school team hinders DBDM. It also appeared that results influenced DBDM; disappointing results had a hindering effect and vice versa. And the last factor that had a hindering effect was the workload; when the workload is too high, it hinders DBDM.

This leads to recommendations for future research; recurrent and frequent reflection on the DBDM process, involvement of teachers in both the implementation process as well as the reflection, and investigate how schools experience influencing factors in relation to the extent to which the DBDM implementation has succeeded.

Keywords: Data Based Decision Making, Results, Primary schools, Promoting factors, Hindering factors.

Table of contents

1. Introduction

1.1 Problem statement

According to the governmental quality plan 'Scholen voor morgen' (2007), Dutch students always performed well on language[1] and mathematics compared to their international peers. The Netherlands belonged to one of the top-level countries, however during the last few years the performance of Dutch students declined. The 'Progress in International Reading Literacy Study'[2] showed for example that the average Dutch student in grade 6 was weaker in comparison with Dutch students five years ago (Mullis, Martin, Foy, & Drucker, 2011). If the Netherlands wants to contribute to the worldwide knowledge economy, the linguistic and mathematical skills of Dutch students need to be improved significantly.

The Dutch ministry of Education, Culture and Science has made the improvement of linguistic and mathematical skills a high priority on its policy agenda. These skills are considered to be a basic requirement that every student needs. To improve these skills data-based decision making (DBDM) was made a core theme in Dutch educational policy (Visscher & Ehren, 2011). The Dutch Inspectorate of Education (2010, p. 5) defines DBDM as '*systematic and goal oriented work on maximizing achievements'*. Schildkamp and Kuiper (2010), provide a more specific definition of DBDM, namely '*systematically analyzing existing data sources within the school; applying outcomes of analyses to innovate teaching, curricula, and school performance, and implement (e.g.) genuine improvement action and evaluate these'*. The analysis of data should be done by teachers, principals and administrators (Ikemoto & March, 2007). It is based on a broad range of evidence, such as student assessment scores and observations of classroom teaching (Schildkamp, Ehren, & Lai, 2012). Such evidence is used to evaluate and improve the means of instruction (Ledoux, Blok, Boogaard, & Kruger, 2009).

The Dutch Inspectorate of Education has researched the number of schools that implemented DBDM. The Inspectorate uses five indicators to measure to what extent the schools have implemented DBDM in practice. These five indicators are:

1) the school uses a coherent system of standardized tools and procedures for monitoring the performance and development of students;
2) teachers monitor and analyze students' progress in a systematic way;
3) the school evaluates the effects of educational care on a regular basis;
4) the school annually evaluates students' results;
5) the school evaluates the educational process on a regular basis

Based on these indicators, the Inspectorate found the implementation of DBDM in 2013/2014 to have increased (Dutch Inspectorate of Education, 2015).
According to the Dutch Inspectorate of Education (2010), learning results could improve when schools use DBDM. Despite the positive expectations of DBDM on improved student results, the effects of DBDM vary between schools (Van Geel, Keuning, Visscher, & Fox, 2016). This study focuses on the factors that influence the effects of DBDM, in other words, the factors that explain why some schools improve more as a result of DBDM than others.

1.2 Objective

Since the Dutch Ministry has made DBDM a core theme in Dutch educational policy it is interesting to gain insight into the factors that influence the effect of DBDM in Dutch Primary Schools on student achievement. Although there is research on the process of DBDM and the preconditions for DBDM, it is not clear which factors have a positive or negative effect on DBDM and thus cause variance in student achievement in different schools. To explain the differences between schools it is necessary

[1] A significant part of language is reading

[2] Progress in International Reading Literacy Study, an international competitive research on reading skills of students in the age of 9 and 10

to gain insight into factors that are influencing DBDM. Insight into these factors will provide possibilities to influence the effect of DBDM. As a result it could help improve student results.

The experiences of a relatively large group of Dutch primary schools have been used in this research. The DBDM-intervention called 'Focus' provided the dataset that has been studied. This intervention distinguishes itself from other interventions that implemented DBDM by involving the complete school team in the intervention. Next to this, this study uses insights or experiences from actual users during the intervention, namely the school leaders and the trainers. The results of this study could lead to a more effective implementation and use of DBDM, lead to better student achievement, and make the Netherlands a top-level country again.

1.3 Main question

This study aims to find out which factors influence the process of DBDM in Dutch primary schools. Therefore the main question of this research is:

- Which factors are influencing the effectiveness of DBDM in Dutch primary schools?

To answer this main question, three research questions have been formulated to guide this study. These research questions can be found in Table 1.

Table 1

Research questions leading this research

Research question	
RQ1:	Which of the factors that were found in the literature do school leaders and trainers experience as hindering or promoting factors for DBDM?
RQ2:	Do trainers and school leaders mention influencing factors that are not mentioned in the literature?
RQ3:	What similarities or discrepancies are there between trainers' and school leaders' experiences with respect to the factors that promote or hinder working on DBDM?

1.4 Overview

In the following chapter, Chapter 2, the conceptual framework of this study will be presented, by introducing the DBDM model. Chapter 3 will show the influencing factors that were found in literature. The next chapter will explain the 'storyline method' that was used to obtain data for this study. It will also explain how the data were analyzed, and the procedure for data collection.

One part of the study compares earlier findings from the literature with experiences from actual practice in Focus schools. The other part of the study analyses whether there are other factors promoting or hindering DBDM, that were not mentioned in the literature. The results of the study will be presented in Chapters 5, 6, and 7, where in each separate chapter the results concerning a single research question are presented. Finally, in Chapter 8 conclusions are drawn and the findings are discussed.

2. Conceptual framework

This chapter presents the concept of DBDM. First a model will explain the process of DBDM. Subsequently, the advantages and disadvantages of DBDM are discussed. The last section describes the different outcomes that were found in schools that implemented DBDM, which is also the incentive for this study.

2.1 DBDM-model

The concept of DBDM exists of basic principles like analyzing the starting situation, defining the desired situation, and the selection and the application of a strategy (a policy or kind of instruction) that will fit the needs of students best (Visscher & Ehren, 2011).

The process of DBDM can be visualized with a model described in Van Geel et. al. (2016). As figure 1 shows it consists of the following four components:

1) analyzing results;
2) setting goals;
3) determining a strategy for goal accomplishment and;
4) executing the chosen strategy.

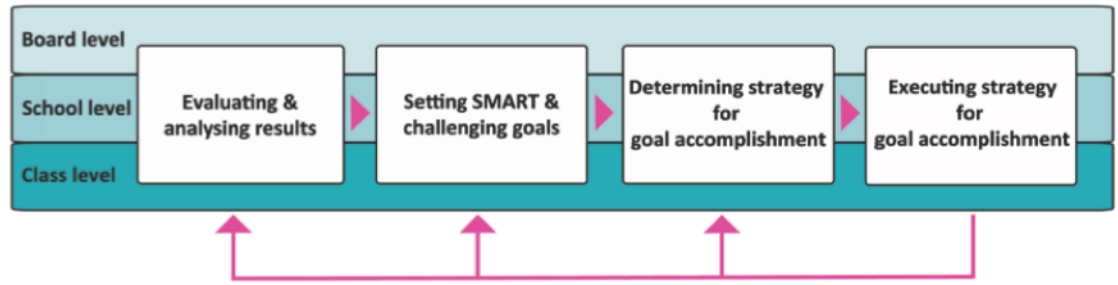

Figure 1: Four-component model of DBDM (van Geel, et al., 2016*)*

As can be seen in Figure 1 each component of DBDM can take place at three levels namely:

- the class level,
- the school level,
- the board level.

At the class level, all activities that take place are focused on improving student achievement and are carried out by teachers. At the school level, the activities in each component are executed by the school leader and/or academic coach in cooperation with other teachers and are focused on teacher activities to improve student achievements. At the board level, the activities in each component are focused on the performance of one or more schools. A school board executes the activities at this level.

The 'Focus' intervention has been executed at the class and school level and thus excludes the board level effects, therefore the further explanation of the model will focus only at the class and the school level.

Component 1. Evaluating and analyzing results

The first component of the DBDM model is characterized by the analysis and evaluation of the current situation. Which means that at class level the teacher will analyze and evaluate the results of his/her students within his/her class. At school level the school leader or academic coach will look at how employees, in this case teachers, are performing. The results of the evaluation and analysis will be the input for the next component in the DBDM model.

Component 2. Setting SMART and challenging goals

In this component of the DBDM model the focus is on setting SMART and challenging goals that are based on the outcomes of the analysis and evaluation in the first block. SMART is an acronym that represents:

- Specific,
- Measurable,
- Attainable,
- Relevant,
- Time-bound.

Specific means that the goal needs to state exactly what one wants to achieve. A large task needs to be divided into smaller pieces and stated in exact sub-goals. Measurable goals have clear criteria to determine whether the goal is reached. Attainable goals are feasible with the available resources like time, effort and money. Relevant goals have a clear objective and really contribute to this objective. Time- bound means that the goal states when to start with working on the goal and when the goal has to be reached.

Locke and Latham (2002) found that goals that are too difficult or not challenging enough, are less likely to be accomplished than goals that require average skills. Therefore, in addition to the SMART criteria goals have to be challenging to make progress.

At the class level this means that a teacher needs to state exactly what he wants to achieve with his class, and more specifically what he wants to achieve with each student. Within each class there are different students who have different levels of achievement, therefore a teacher needs to differentiate in his goals. The school leader has to do the same at school level, with the difference of formulating goals for his team.

Component 3. Determining a strategy for goal accomplishment

This component of the DBDM model is about determining a promising strategy to accomplish the goals set. The chosen strategy is based on insight into the gap between the data analysis results and the goals that have been set. After investigating the current knowledge level of the student and the goal that is aimed for, a fitting strategy needs to be chosen in order to accomplish that goal.

At the class level a teacher needs to consider how to achieve the goals and what resources are required to accomplish it. One should think about what pedagogical content knowledge and/or skills are needed, and about whether one masters these or not. One should ask themselves the following questions: *"What lesson materials do I need and are these already available? If not, what do I have to do in order that they are available, or do I need to think about other options?"* The teacher should keep in mind possible hurdles that need to be taken to accomplish the goal.

To determine a strategy at school level, a school leader needs to consider what teachers need to be able to develop themselves professionally. One should also consider other organizational improvement points. The environment of the school, team effort, and the motivation of the team are examples of these. And the school leader needs to look at the available and required resources: time, money, courses, communication, workshops, training and so on.

Component 4. Executing strategy for goal accomplishment

This component is about the execution of the strategy that was chosen in the previous component of the DBDM model.

At the class level, the teacher will perform his lessons executing the strategy that was chosen to improve the results of his/her students. At school level the school leader will execute the strategy that he planned to accomplish the goal.

It should be noticed that the model consists of four components that encompass activities that are not always executed in one and the same fixed, linear order. This means that if one executes the strategy for goal accomplishment and it appears to be necessary to make a change in the chosen strategy, it is possible to make adjustments to the strategy immediately (instead of going through the whole process first).

2.2 DBDM advantages

The Ministry of Education, Culture and Science (2007) stated that taking tests, and analyzing student results should be an important aid in the improvement of education and in improving student achievement. This is confirmed by the research of the Inspection of Education (2010), which shows that schools which perform an analysis of their students' achievements, and which make changes in their teaching based on these results, do indeed improve their student results. The main goal of DBDM is to improve student achievement, however DBDM has more advantages. Schildkamp and Kuiper (2010) explain that student achievement data motivates and stimulates professionals to make deliberate and explicit decisions about goals, content and strategies for instruction.

The data facilitates opportunities to address student's learning needs (Schildkamp & Lai, 2013) and it helps teachers and school leaders to interpret their changing environment and to determine whether there are problems. Additionally, Coe et. al. (2014) state that data on student progress is an essential indicator for evaluating the quality of teaching and therefore supports teachers and school leaders to evaluate their own functioning.

Teachers and school leaders will not only make more informed decisions if they are based on data, additionally the data will also provide support for these decisions if one is faced with opposition (Flowers & Carpenter, 2009). Eventually, all advantages should lead to better performing, confident professionals and to better education, which is based on data analysis and other forms of data utilization (Visscher & Ehren, 2011).

2.3 DBDM Disadvantages

Despite the advantages DBDM has, there are also some potentially undesired effects that need attention. Ledoux et. al. (2009) mention the effect of school leaders and teachers who are too much focused on test results. This could result in spending too much time on taking tests, which cannot be spent on other educational practices, for instance instruction. One should also be aware of a culture of 'teaching to the test'. This means that teachers are too much focused on results instead of the learning process. Another side effect could be data selectivity. This means that schools only use data requiring small improvements. Data that demand more complicated and long-term actions for improvement are ignored, which reduces the possibilities to improve education (Schildkamp and Kuiper, 2010). Too much stress on test results and performance could not only lead to pressure on school leaders and teachers, but also on the students. This could result in children struggling with performance anxiety and losing their pleasure in education (Ledoux, 2009).

2.4 Differences between schools

Van Geel et al. (2015) found varying results in the improvement of student achievement between primary schools, which had implemented DBDM. This study showed that DBDM in general had a positive effect on student achievement. According to Ledoux et al. (2009) the effectiveness of DBDM is dependent on the school's starting point. The authors argue that schools with a higher number of low-performing students are more willing to improve their student achievement levels compared to schools that have more high-performing students. However, van Geel et al. (2017) showed that the 'Focus' intervention improved the achievements of both low-SES[3] as well as high-SES students but was not successful for medium-SES students in high-SES schools. Thus, it still is not very clear what causes the differences between schools in the improvement of their student achievement levels.

[3] Students are assigned extra 'weight' if their parents are from a lower educational background. Students can get an extra weight of 0.30 (maximum parental educational level: lower vocational education), or 1.2 (maximum parental educational level: primary education, or special needs education). School receives additional funding based on student weights as it is assumed that schools with students with student weight have a more difficult job to do.

The literature about DBDM presents a variety of factors that possibly influence the successful implementation of DBDM. Different studies (Boudett & Steele, 2007; Lachat & Smith, 2004; Love, Stiles, Mundry, & DiRanna, 2008) focused on the preconditions for DBDM and state that it is necessary to build data capacity to ensure that data will be used effectively. This means that schools need to compose data teams, assign data coaches, allocate time in the school calendar for collaborative data analysis, develop data analysis skills and assessment literacy, and to process and show data in formats that facilitate inquiry and analysis. However, there is still limited evidence that these features explain the successful improvement of student performance via DBDM.

This study is therefore focused on identifying the factors that were experienced as hindering or promoting the implementation of DBDM by school leaders and trainers of schools that have implemented DBDM in practice in the Focus intervention.

3. Categorization of DBDM influencing factors based on DBDM literature

Based on a review of the research that had been done already on the preconditions for DBDM, four categories of possible factors that influence DBDM were made. The first category in this research is called '*use of data as feedback*' and refers to the precondition of processing and showing data in formats that facilitate inquiry and analysis, which is the core component of DBDM. The next category is called '*implementation process'* and refers to the precondition of implementing time for collaborative analysis, and working with data teams and coaches, which are all basic conditions for working on DBDM. The third category refers to individual skills in data analysis and assessment literacy and is called '*participants' features'*, within this category a distinction is made between the school leader and the teachers. The last category is called *'organizational features'* and refers to the overall organization of the school and its preconditions for DBDM.

Each category will now be explained and within each category a description of the factors potentially influencing the effectiveness of DBDM will be presented.

3.1 Use of data as feedback

The first category to be elaborated is the category 'use of data as feedback', which has a strong connection with the first component of the DBDM model 'evaluating and analyzing results'.

Student Monitoring System

Data can include students test scores. However, data should also be disaggregated and linked to other data in order to support schools to make improvements, i.e. data should be disaggregated into personal information (gender, age, SES) and contextual information (lesson plans, homework) and subsequently be linked to the students' achievement (Flowers & Carpenter, 2009). This enables the possibilities to perform a meaningful analysis and interpretation of results. As such it provides support to teachers about which goals have priority and it gives direction to their teaching practice. The systematic use of tests and the interpretation of data also give school leaders and teachers insight into the relevance of the results. It also provides the opportunity to compare this with e.g. other schools, national reference levels, or with the results of a year before (quality plan 'Scholen voor morgen', 2007).

To facilitate schools in data disaggregation, easy data access, and showing useful data formats, technology that supports these activities could be used (Ronka et al., 2009). Therefore a digital student monitoring system is preferred when working on DBDM. A digital student monitoring system is a digital system, which gives teachers feedback about the results of the student tests (Faber, Faber, & Visscher, 2014). A student monitoring system in which all results can be registered supports schools in analyzing all data and in comparing these with other data. Analysis of these data can support schools to set goals and to evaluate them, therefore a student monitoring system is a good feedback instrument that helps to improve education and student results (Van Geel & Visscher, 2013). To promote the optimal use of the student monitoring system, to support instructional use, it is important that teachers make sure the database is complete and the data are obtained in a short period of time (Ronka et. al. 2009).

One issue is that teachers quite often lack the required training or experience in using data to make decisions and thus feel overwhelmed and therefore create a negative attitude towards the system (Ronka et al. 2009; Wayman, 2007). Teachers lack the required analytical skills to interpret scales and means. They therefore cannot obtain insight into specific students' needs (Oláh, Lawrence, & Riggan, 2010). For this reason it is important that the student monitoring system is user-friendly, which means that the results should be displayed in an easy to understand format, like for example a graph. Next to this, it should be possible to link the data to the individual student data to help teachers identify the problems and specific needs of the student and as such support instructional data use (Ronka et al. 2008; Faber & Visscher 2014).

Analyze data on both individual and class level

Data are only useful for the improvement of education and student achievement if interpreted correctly. Therefore it is important that educators use the student monitoring system well, which means that they do not use the student monitoring system only for the registration and analysis of results.

Teachers prefer feedback at the level of an individual student Verhaeghe et al., (2010). However, the outcomes of the analysis at the individual level are the result of the individual features of a student, while analyses of outcomes of multiple students provide feedback on the results and quality of instruction. If the majority of the students has poor results on a specific item in a test it can be concluded that it was a bad item in the test or that probably the instruction for this topic was not sufficient (Faber et.al., 2014). Therefore it is recommended that teachers not only use feedback on individual level, but also on the class level. For the school leader it could be helpful to compare the results of teachers at the school level or with the results of other schools.

Frequent and longitudinal data analysis

Despite the earlier mentioned advantages of using a student monitoring system schools do not sufficiently use the information of the student monitoring system to improve their education at student-, class-, and school level ('Scholen voor morgen', 2007).

One issue is that teachers focus on student data only at one moment, whereas it is important to analyze student data on a more regular basis as this makes it possible to compare and see trends in the data. Using the ability score of students helps to follow the development of students over a longer period of time (grade 3-8) by comparing consecutive test moments. Another advantage of analyzing student data on a regular basis is that it should give the teacher a chance to make timely adjustments to his/her instruction. Hellrung & Hartig (2013) add to this that the frequency of analysis of student data will increase the effect of DBDM because it is easier for teachers to link the feedback from the student monitoring system to their practice if less time has passed between the test and the feedback.

Figure 2a and 2b give an example of the possibilities of a student monitoring system to represent student results as a basis for data analysis. Both figures are from a student monitoring system called 'CITO'. Figure 2a is an example of a standard student report and figure 2b is an alternative student report that represents the results in a graph. Teachers could use both reports as a feedback instrument as both figures show the level of the student and its ability score. However, the graph (figure 2b) gives a good image of all levels together and the average line of growth. This enables analyzing if a student is progressing well, and, if necessary, to make timely adjustments in the individual student plan.

When performing a longitudinal analysis one could also see that after every period the student was at level 4 or 5 growth increased even faster than average growth. And every period the student was at level 3 growth was less than expected. One explanation might be that the student received extra instruction if the result was insufficient (i.e. IV) and vice versa.

The standard report does not show the growth of the student compared to average growth. For example, at test moment E4 and M5 the level of the student was III, which is the average level of a Dutch student. However, the graph in the alternative report shows that the student line of growth is slower than what is expected, which could be a signal to make adjustments in the individual student plan. Using the alternative report, one could have intervened before entering level IV. Therefore the use of the alternative report is preferred.

Date	Grade	Task	Test Score/ Ability score	Score interval	Level
06-02-2009	4	M3 start +1	38/ 101	99:102	V
05-06-2009	4	E3 start +2	37/ 111	109:112	III
09-09-2010	5	M4 start + 2	33/ 117	116:119	IV
21-06-2010	5	E4 start +2	34/ 122	120:124	III
05-02-2011	5	M5-digi S+2	28/ 126	125:128	III
03-06-2011	5	E5 start + 1	38/ 128	126:130	IV

Figure 2a: Example of a standard student report (CITO)

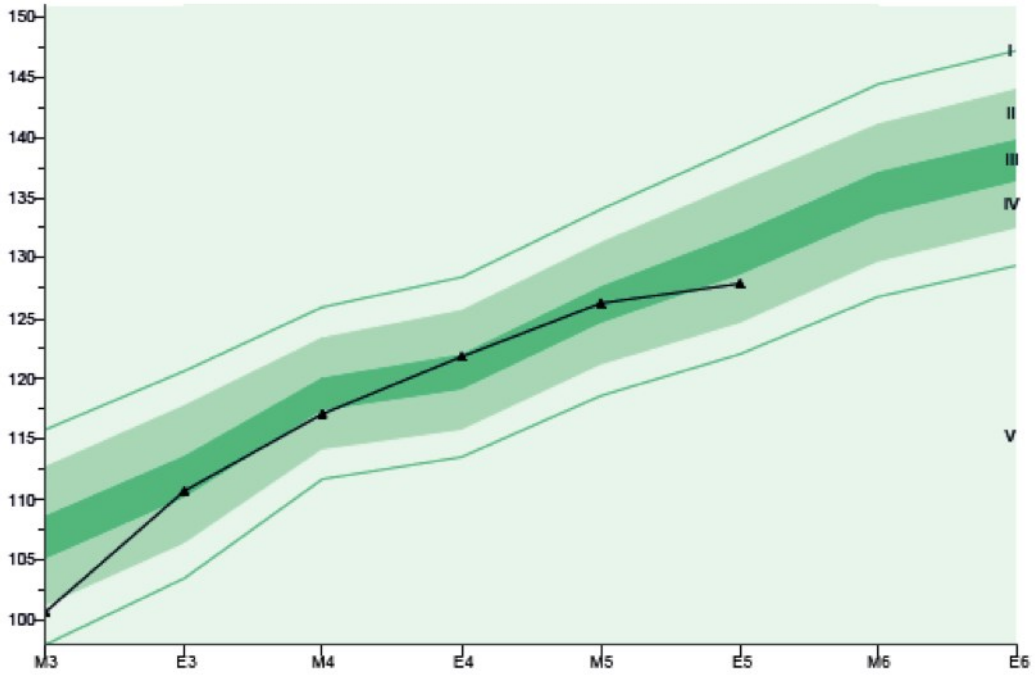

Figure 2b: Example of an alternative student report (CITO)

Based on these findings it is expected that, in this category, the following factors will influence DBDM:

- user-friendly digital student monitoring system
- analysis of data on both individual and class level
- frequent and longitudinal data analysis

3.2 Implementation process

This category focuses on the basic conditions that enable schools to work with DBDM and refers to the preconditions of implementing time for collaborative analysis and for working with data teams and coaches.

Clear goals and expectations according student achievement and DBDM

In order to give meaning to the interpretation of results, working on DBDM should be integrated in an explicit context. Which means that there should be a school vision and long-term goals should be clear. In other words schools need to embody the DBDM process into current practice (Ledoux et.al. 2009). Cohen and Ball (2001) explain that it is important to take the environment into account since the environment influences the instructional interaction with school leaders, teachers and students. Before the implementation of DBDM it should be clear what the starting point of a school is. To determine the

starting point, schools could review their school plan to determine what the goals are and what actions should be emphasized. In conjunction, the goals, plans and action points should be communicated and clear to the whole school team (Lachat & Smith, 2004; Ledoux et. al., 2009). To support schools in the implementation of DBDM, Ledoux et. al., (2009) explain the added value of the use of a 'quality model', which is a model that describes a time path to implement innovations, the goals, and the priorities.

Time

Another factor that is important for the implementation of DBDM is time. In the research of Ledoux et. al. (2009) one of the problems that schools experienced was a lack of time. Therefore teachers could not bring their new approaches, e.g. more differentiation in classrooms, into practice.
Implementing DBDM in school is a process that takes time to practice and optimize DBDM (Desimone, 2002). Teachers need time to learn new skills, to make significant changes to their practice, and to evaluate on it (Ledoux et. al. 2009; Timperley, 2008; van Veen, 2010).

Time is also necessary to execute the processes of DBDM itself: to analyze and discuss data, to set goals, and to determine and execute the strategy for goal accomplishment (Visscher & Ehren, 2011).

Several studies emphasize the importance of interaction and collaboration (Flowers et al.2000; Timperley, 2008; van Veen, 2010; Ronka et al. 2009). Interaction with colleagues about experiences, effective teaching strategies, and student learning can help teachers to integrate new learning into existing practice. Next to this Flowers et. al. (2000) state that groups who work collaboratively with data, create a shared responsibility for student achievement. The analysis and the discussion of data as a group promotes understanding and interpretation, which are important for creating an effective evaluation environment (Flowers & Carpenter, 2009).

When working collaboratively on data, schools or teachers should be able to perform a more in-depth analysis on the causes of improved student results. Teachers can support each other in linking the outcomes of the analysis to concrete adjustments in their lessons or instructions (Wayman et al., 2012).

To support collaborative analysis, Ronka et al. (2009) emphasize the importance of scheduled time at key data points. Schools can proactively organize evaluative moments, which also stimulate data analysis frequency and prevents the kind of singular evaluation moments that were mentioned in section 3.1.

Data coach or trainer

A data coach or trainer could facilitate the implementation process of DBDM, which includes scheduled moments for analysis and evaluation, for collaboration, and room for professional development (Ronka et al., 2009). The coach can contribute to the continuation of the development process of the school. Support can be given with regard to the analysis and evaluation process (Ledoux et al. 2009). This promotes objectivity in data selection, correct data processing, and formatting.

Timperley (2008) states that the trainer needs to be knowledgeable and have proven expertise. To reduce possible resistance from teachers, this expertise needs to be evidence-based and the trainer needs to have powerful examples from practice (Van Veen, 2010). This expertise includes multiple learning approaches. The chosen approach is adapted to actual practice and needs to be responsive to the learning processes (Timperley, 2008).
When school developments are threatened the trainer needs to have sufficient overview, insights and skills to guide the school team (Ledoux et. al. 2009).

To summarize, the expected influencing factors in the category 'implementation process' are:

- Goals and expectations regarding student achievement and DBDM:
  - clear student achievement goals
  - data analysis and evaluation implementation plan
  - clear DBDM tasks and responsibilities for the whole team

- Time:
  - scheduled, recurrent time for the evaluation of the process of DBDM

- scheduled and recurrent time for collaborative analysis

- Data coach or trainer:
  - expertise
  - skill to adapt to team characteristics

3.3 Participant features (school leaders & teachers)

In this report two groups are distinguished when looking at DBDM in Dutch primary schools. The first group consists of school leaders who act at the school level. The other group consists of teachers who act at the class level.
When implementing DBDM, both the school leaders as well as the teachers, have a new and difficult task. Data needs to be used to improve educational practice, which means analysis and interpretation of student achievement data in the form of test results (Wayman, Midgley, & Stringfield, 2006; Visscher & Ehren, 2011).

3.3.1 School leaders

The school leaders are responsible for fulfilling practical conditions like the selection of a digital student monitoring system, and providing recurrent time for data-analysis. In addition to that, the school leaders are assumed to have an important role regarding the DBDM culture within the school. The school leaders influence the attitude of teachers towards DBDM. By promoting clear visions and norms to DBDM one provides structure and encourages the use of data to improve education (Levin & Datnow, 2012; Marsh, 2012).

Data literacy of the school leader

To carry out the DBDM vision and culture, the data literacy of the school leader should be sufficient. Crusoe (2016) used the following definition of data literacy:

'Data literacy is the knowledge of what data are, how they are collected, analyzed, visualized and shared, and is the understanding of how data are applied for benefit or detriment, within the cultural context of security and privacy' p.38.

Earl and Katz, (2006) explain that school leaders who become more knowledgeable about data use, can more effectively evaluate both his personal a well as the school its existing capacities, identify strengths and weaknesses, and better develop plans for improvement. There are five characteristics that determine if the data literacy level of the school leader is sufficient, which is necessary to become a successful DBDM school leader:

1. The school leader needs to understand the goal of data-use, which is to improve education and not just an administrative task.
2. The school leader needs to have enough knowledge and skills to distinguish useful from useless data.
3. The school leader needs to acquire knowledge of (statistical) measurement issues.
4. The school leader is able to interpret the most important signals of the data correctly.
5. The school leader needs to pay attention to the reporting of data and to share these data with employees.

Wu (2009) states that among school leaders there is a lack of data-literacy, which means that school leaders do not have sufficient training in understanding, analyzing, and interpreting data, and therefore they do not know what the data mean and how to use them (Earl & Katz, 2006; Mandinach & Honey, 2008; Wu, 2009). This results in school leaders who are struggling with the data and who find it difficult to enable teachers to work with it (Levin & Datnow, 2012). They therefore feel insecure about their schools in leading DBDM efforts (Wu, 2009).

Instructional leadership

The school leaders need to be the driving force and fulfill the role of process supervisor (Visscher & Ehren, 2011). To develop teachers' expectations for improved student achievement, to organize and promote engagement in professional learning communities, a school leader should show

stimulating instructional leadership (Timperley, 2008; van Veen, 2010). Horng and Loeb (2010) explain that stimulating instructional leadership characterizes itself as leading with a 'hands-on' mentality and leaders who show engagement with the curriculum.

Levin and Datnow (2012), explain that the school leaders should show specific actions to effectively guide the team. School leaders should be able to mentor their staff. Therefore school leaders should keep track of performance and provide support by observing practice, providing concrete feedback and by modeling instruction (Horng & Loeb, 2010).

Butler et. al., (2004) highlights the task of a school leader in making sure that professional development and collaboration time is protected. During this time the focus should be on the use of student achievement data to improve education and data-based decision making should not only be seen as an administrative task Datnow & Hubbard, 2015).

Therefore effective instructional leadership entails giving direction to data teams, modeling effective data use, scheduling and protecting time for collaborative data-based meetings, and connecting data analysis to clear follow-up steps and sub-goals, and the communication of these with the team (Ronka et.al. 2009).

Based on these findings it can be concluded that two features of the school leader could affect DBDM. The first one is the level of data literacy of the school leaders. The other is how the school leader performs as an instructional leader The extent to which a school leader has one or more of the described competences or actions determines how much and what kind of effect the school leader has on DBDM.

- Data literacy of the school leader
  - understands the goal of data use
  - knows how to analyze and interpret data
  - shares the findings of analyses with the team

- Instructional leadership
  - mentors teachers with respect to DBDM
  - schedules and guarantees time for collaborative data analysis
  - supports professional development
  - clear vision and norms regarding DBDM

3.3.2 Teachers

As explained above, the second group of participants, who play a crucial role in the process of DBDM, are the teachers. Teachers act at the class level. The quality of teachers is assumed to have a great influence on student achievement (Coe et al., 2014).

Data literacy of teachers

Data is used to inform instruction. Therefore teachers also need to have sufficient data literacy. The definition of data literacy specified for the teaching context is slightly different from the definition of data literacy for school leaders. To evaluate the extent to which the data literacy level of teachers is sufficient, the definition of Gummer and Mandinach (2015) can be used:

"Data literacy for teaching is the ability to transform information into actionable instructional knowledge and practices by collecting, analysing, and interpreting all types of data (assessment, school climate, behavioural, snapshot, longitudinal, moment-to-moment, and so on) to help determine instructional steps. It combines an understanding of data with standards, disciplinary knowledge and practices, curricular knowledge, pedagogical content knowledge, and an understanding of how children learn" (p. 2).

Educators should also link the feedback from the student monitoring system to their own instructional behaviour (Faber, van Geel & Visscher, 2013). However, relating the results of students to their own acting within their class or school seems difficult for teachers and school leaders (Van Geel & Visscher, 2013). Faber et al. (2013) describe that the results of the analysis of the student monitoring system are attributed to the student instead of to the lessons offered by the teacher.

DBDM teaching skills

In the first component of DBDM, evaluating and analyzing results, the most important competences are to collect, organize, analyze, interpret data, and to draw conclusions. Gummer and Mandinach (2015) make clear that the analysis is not limited to the test results. Teachers need to analyze a combination of multiple data like for example behavioral data in combination with test results. Next to this, teachers need to link the used the strategy to the other data. Based on the analysis of all data the teacher needs to draw conclusions, which are input for the next steps in the DBDM process.

In the second component, setting SMART and challenging goals, the teacher needs to have the capability to recognize and describe the starting situation and the desired situation (Visscher & Ehren, 2011). Therefore, besides analytic skills, teachers also need to have sufficient knowledge of final learning objectives and its sub goals. Teachers need to be capable to formulate SMART and challenging goals that fit the previously stated conclusions.

In the next component the teacher needs to determine a strategy for goal accomplishment, which means that the teacher needs to be able to select and apply an instructional strategy that fits best for every student. Therefore the teacher needs to be able to differentiate between students and have knowledge about the different instructional strategies and resources. Resources help the teacher to adapt their teaching, to provide support to the student, and to test the progress of the students. Examples of resources are test materials or instructional materials. Next to this, a teacher should also have knowledge about the relation between data and instruction, which makes it possible to choose an instruction that fits the goal (which should be challenging). In this stage the knowledge should not be restricted to knowledge about how students learn, but also pedagogical content knowledge for example (Gummer & Mandinach, 2015).

In the last component of the DBDM process the strategy for goal accomplishment is executed, which means that teachers need to have general teaching skills and be able to work in different instructional groups. Therefore, the teacher should be capable to differentiate in his instruction. Also during this stage it is insufficient if the teachers knowledge is limited to curricular knowledge, teachers also need to have subject matter knowledge.

However, Ledoux et al. (2009) describe that according to educational experts there is insufficient expertise with respect to the analysis of student data. A lot of teachers experience difficulties with the analysis of test data, the interpretation of analysis results and the translation of the findings to their teaching practice (Hellrung & Hartig, 2013; Inspectie van het Onderwijs, 2013; Williams & Coles, 2007). A reason for this could be that teachers have not been trained enough, or have insufficient experience in analyzing data, in using them to set goals (Ronka et al. 2009), and in translating that to their own teaching behavior (Van Geel & Visscher, 2013).

Attitude of the teacher

Next to all knowledge and skills that a teacher needs to have in each component of DBDM, the attitude of the teachers is also an important factor. Borko et. al. (1997) describe that the motivation and the beliefs of a teacher determine which new instructional practices are interpreted and executed. In order to have more impact, knowledge building should directly influence teacher beliefs. Because the effectiveness of teachers is a factor influencing student achievement, it is necessary to maximize the expertise and motivation of the teachers to use data, and to inform instruction when implementing DBDM in their school (Curry et.al., 2015).

Summarizing this section it can be concluded that the teacher needs a variation of knowledge and skills to effectively use DBDM. Next to this, the teacher's attitude could also influence the process of DBDM.

- Teacher data literacy
  - collecting, analyzing, and interpreting multiple data to inform practice
- Teaching-related DBDM skills
  - draw conclusions based on data
  - set goals based on data
  - select the most effective teaching strategy that fits the goals
  - execution of the teaching strategy
- Teacher attitude towards DBDM
  - use data to inform instruction

3.4 Organizational features

Joint vision on education and development

To successfully implement DBDM, there needs to be a shared vision on DBDM and its added value for education and improved student achievement (Van Geel & Visscher, 2013). There needs to be clarity on the goals and norms to achieve, and trust that a goal is achievable. Ledoux et al. (2009) found that discrepancies between the norm and the actual student achievement do not always lead to action. Teachers sometimes think the norm is too high, or it is expected that achievement will increase with time. Therefore the goals and the plans to achieve them need to be documented.

It is also preferred to have consensus about the plan by all professional stakeholders (which are the school board, school leader, academic coach and teachers). Communication about the goals, strategies and timelines within the whole team ensures both understanding of the plan as well as the responsibilities of each party. Involving the team as much as possible in the process will help to achieve a buy-in, shared direction and shared responsibility (Flowers & Carpenter, 2009).

School culture

It is expected that schools, that have a culture that is achievement-oriented and focused on DBDM at all times, implement DBDM more successfully. This means that schools pay attention to issues of educational leadership, policy, and responsibilities of all team members. In these schools employees have shared beliefs and they collaborate (Boudett & Steele 2007; Firestone & Gonzales, 2007).

Holcomb (1999) states that it is preferred to have a culture in which people are excited about the use of data. Therefore it is important that teachers understand its implications for practice, feel the need to critically look at data to reflect on their own functioning, and that they are open to changing their practice.

Teachers are more likely to begin to practice reflective teaching when data is used to inform instruction rather than to evaluate instruction (Curry et. al. 2015). A culture of trust is therefore essential, which means that data are not used to judge, but to support improvement (van Geel & Keuning, 2016). A culture of trust avoids the feeling of teachers of being overwhelmed by the use of data and the skills required (Ronka et. al. 2008).

Next to this, an environment in which there is room for mistakes and feedback to improve provides multiple opportunities for teachers to learn new information and skills (Timperley, 2008). According to Datnow and Hubbard (2015) learning new information and skills can be realized by creating professional communities, organizing training sessions, and by facilitating moments to have interaction with coaches, consultants, and the school leader. Interaction with colleagues about personal professional development and about student achievement can help teachers to integrate new learning in existing practice (Timperley, 2008). Ledoux et. al. (2009) found that in 'good practice' schools there is consultation between the teacher and academic coach about individual student achievement, the

development, and action plan. Achievements at school level are most of the time discussed during team meetings and sometimes during an appraisal in which the functioning of the teacher is evaluated.

It is preferred to involve teachers in the content of the professional development trajectory because that creates shared responsibility (Van Veen, Zwart & Meirink, 2012). However, Ledoux et al. (2009) found that teachers are not always involved during the interpretation phase, except when the results are insufficient.

In conclusion, it is expected that the following organizational factors influence DBDM:

- A joint vision on DBDM
- A school culture promoting the use of data for improvement
- School internal DBDM-collaboration
- Teachers' professional development for DBDM

3.5 Model

Based on the findings in the previous sections, a research model was developed (Figure 3). This model summarizes and visualizes the factors that are expected to influence DBDM. In the first column, the four main and broad categories that are expected to influence DBDM are displayed. The second column presents arrows, which specifies for each category which factors are expected to influence the implementation of DBDM.

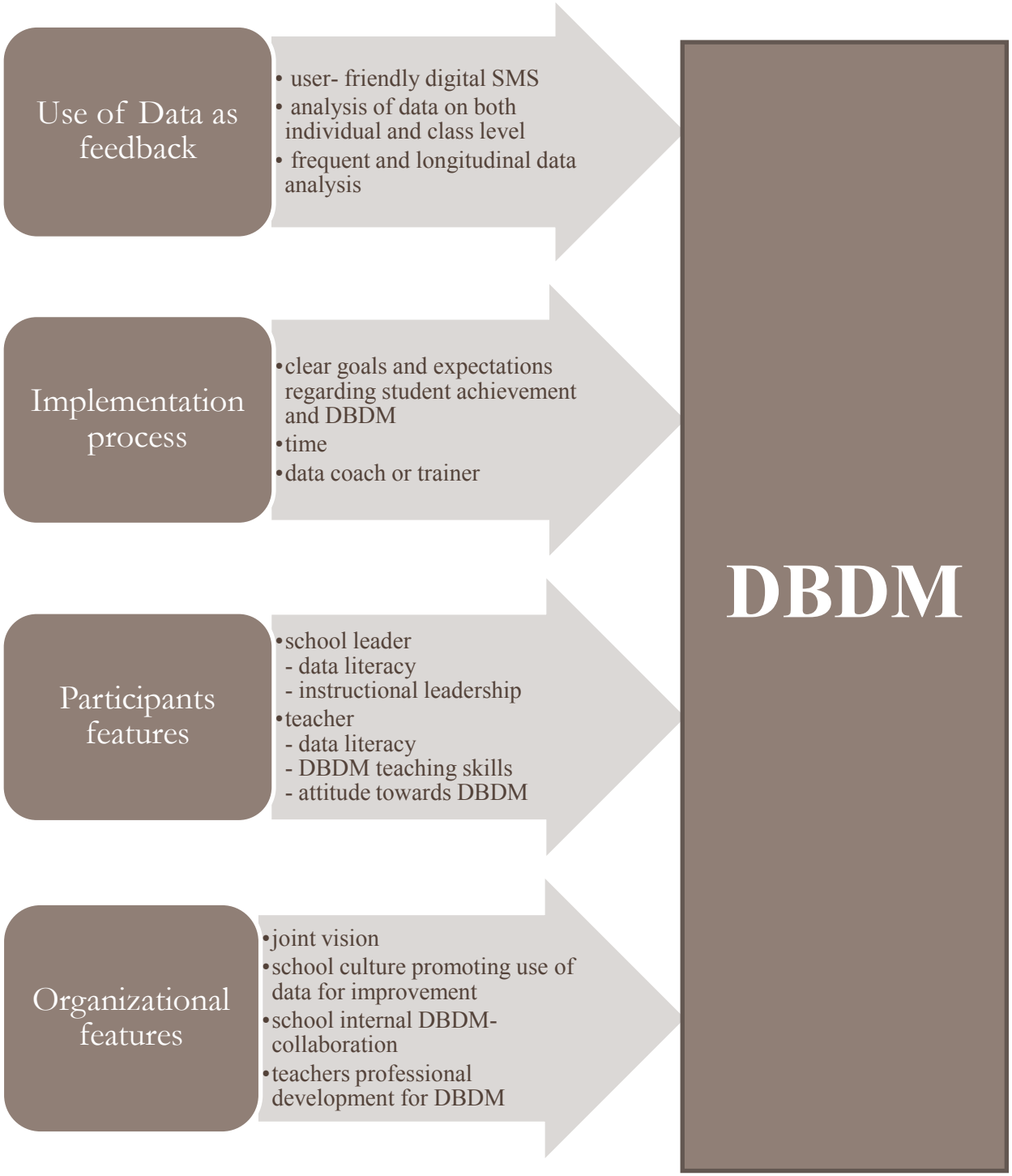

Figure 3: Research model

4. Method

In this chapter, the method for this study is described. As described before, all schools in this study participated the same intervention. Therefore this chapter will start with a short introduction on the intervention called "Focus Project". Subsequently, the research design is explained. Then the sample and the procedure for data collection are elucidated. Finally, the instruments used to gather the data are described, and it is explained how the data were analyzed.

4.1 Focus Project

In the school year 2009-2010 the University of Twente started an intervention with the aim to implement and sustain DBDM within the whole school organization. An example of the content of a training was to teach teachers to work with the 'student monitoring system': what analyses are possible and how do I interpret the data? Eight schools out of the area of the University of Twente joined in a pilot study. The experiences and knowledge from this study were relevant and schools asked for help to learn how to make the transfer from knowledge of the student monitoring system to the use of these analyses in the daily practice.

The success of the pilot resulted in the development of an extensive training for 43 schools, mainly in Twente, called Focus I. The goal of the training was to implement and sustain DBDM within the whole school organization. Within this Focus I project school teams followed the training separately: during the first school year (2010-2011) teachers from grade 1-5, school leaders, and academic coaches were trained, in the second school year (2011-2012) teachers from grades 6-8 followed the same trajectory. All 43 schools worked on DBDM for mathematics (Staman, Visscher, & Luyten, 2014).

The Focus II project started in school year 2011-2012. The main difference between both trajectories is that within Focus II the whole team participated in the two-year training trajectory. The first year was similar to the content of Focus I, however during the second year they worked on the broadening and deepening of DBDM and the integration of new subjects within DBDM. Next to this the coverage area significantly increased with a total of 67 participating schools in Friesland, Drenthe, Flevoland, Noord-Holland, Zuid-Holland, Gelderland and Overijssel (Teunis, 2013). The Focus III project started in 2012-2013 and 44 schools participated in this trajectory.

The University of Twente appointed trainers to the Focus project. To compare the effects of the training between schools it was important that the training was as much as possible the same across schools and trainers. Therefore the planning of training activities for all schools corresponded to a time line, each meeting had one topic, which was the same for every school. The content of the meetings was more or less fixed for all schools, the same Power Point slides were used, and the same assignments were done in all schools. Figure 3.1 shows the content and type of each meeting of the Focus training. Trainers had to present information the same way, therefore before every meeting, the trainers discussed the content for that specific meeting intensively with each other and with the project supervisor. However, because of variation in school teams' prior knowledge, team members' needs, and the subject chosen by a school, the time a trainer spent on a specific topic within a meeting varied somewhat between schools (Van Geel et al., 2015).

Table 2

Content of the meetings of the Focus project

		Type of meeting	Content
Year 1	*S*	*School leader/ School board meeting*	Fulfilling the practical preconditions and stressing the importance of the role school leader/school board
	1	Team meeting	Analyzing test score data from the student monitoring system
	2	Team meeting	Subject matter content – curriculum Individual diagnosis of students' learning needs
	3	Team meeting	Goal setting and developing instructional plans
	4	Team meeting	Putting instructional plans into action Monitoring and adjusting instructional plans based on test

			data from content mastery tests and daily class work
	S	*School leader/ school board meeting*	Discussing progress and goals for the next period (trainer, school leader and school board)
	5	Team meeting	Evaluating standardized test performance data (and intervention results)
	6	Team meeting	Collaboration in the school: how to learn from each other by means of classroom observations
	S	*School leader/ school board meeting*	Discussing progress and setting goals for the next period (trainer, school leader, and school board)
	7	Team meeting	Evaluating standardized test data
Year 2	1	Team meeting	Meeting based on issues related to DBDM raised by the schools themselves
	2	Coaching activity	Coaching in the classroom
	S	*School leader/ school board meeting*	Discussing progress and goals for the next period (trainer, school leader, and school board)
	3	Team meeting	Evaluating standardized test performance data
	4	Team meeting or coaching activity	Content based on issues raised by schools (optional: extra classroom coaching session)
	S	*School leader/ school board meeting*	Discussing progress and how to sustain DBDM (trainer, school leader, and school board)
	5	Team meeting	Evaluating standardized test performance data Sustaining DBDM

4.2 Research design

This qualitative study is of an exploratory nature and consists of three parts. Each part aims to evaluate factors that influence DBDM, all with their own focus related to a research question. The first research question focuses on analyzing which factors that are described in the literature are experienced by school leaders and trainers as hindering or promoting on DBDM. The second research question aims to identify factors, mentioned by school leaders and trainers, which were not found in literature yet. Subsequently, the goal of the third research question was to explore if there were differences in the experiences of school leaders and trainers, thus if there were differences in factors they mentioned as affecting the implementation of DBDM.

In order to determine factors that could influence DBDM, a literature study was conducted, of which the results can be found in chapter 2. After determining the factors that could influence DBDM, the following step was to find out what school leaders and trainers experienced as hindering or promoting factors. By means of interviews with the school leaders, sometimes in combination with the academic coach, and by studying trainer reports about the DBDM-implementation process in the schools, the factors mentioned by the school leaders and the trainers were compared with the factors described in the literature. Factors mentioned by school leaders and trainers, which were not found in literature, were grouped together and analyzed later to answer the second research question. The third research question was answered by comparing the results of the school leaders with the results of the trainers.

4.3 Respondents

In this study, all primary schools that participated and completed the Focus II or Focus III training were included in the research. These primary schools all have followed the same training trajectory and worked on DBDM. Within this sample, two groups of respondents were selected. The first group of respondents existed of all school leaders (in combination with the academic coaches) from all the schools that completed the Focus trajectory. In the school years 2011-2012-2013, 53 schools participated in Focus II, and in the school years 2012-2013-2014 another 48 schools started with Focus III. Schools could voluntarily participate within the Focus project. Eventually 96 schools fully

completed the Focus trajectory.
The second group of respondents included all the trainers who guided the Focus trajectory of these 96 schools, which is a total of 7 trainers. Descriptives of the schools that completed the Focus project can be found in Table 3.

The sample of schools that participated in the Focus project is representative for Dutch primary schools in the Netherlands. Table 4 provides an overview of some features of the schools in the Focus trajectory in terms of school size, urbanization, and students' socio-economic status (SES). Compared to the national population of primary schools in the Netherlands, participating schools had a more than average number of students with a lower-SES background, and the average school size (number of students) was a little above the national average.

Table 3
Descriptives of the school teams in the Focus project

	Descriptive Statistics			
	Min (%)	Max (%)	M (%)	SD (%)
Men	0	38	16,8	7,2
Women	62	100	83,2	7,2
Weight students	0	84	24,8	23,0

Table 4
Features of schools participating the Focus project

	Frequency	Percentage
School Size*		
Small (<150)	27	28,1
Medium (150-350)	49	51,0
Large (>350)	20	20,8
Urbanization		
Urban (G4)	18	18,8
Suburban (G32)	41	42,7
Rural	37	38,5
Student-SES		
Small	26	27,1
Average	48	50,0
Large	21	21,9

*Average number of students of a Dutch primary school: 211

4.4 Instruments/ procedure

Data was collected by means of interviews based on the 'Storyline method'. Since the interviews used for this study contain qualitative data, data interpretation by the researcher is an important activity. However, Attride-Stirling (2001) explains that sometimes meaning and deep understanding of a phenomenon can only be understood in its social context. Practitioners can give the most valuable information about factors that promote or hinder DBDM. The data-collection method used offered school leaders the opportunity to reflect on their DBDM implementation process during the entire intervention period. An advantage of this method is also that it provides respondents the opportunity to give their own answer, which gives the researcher a clear view of all possible factors experienced by school leaders and trainers (Beijaard, Van Driel & Verloop, 1999).

First, the trainer explained the storyline method to the school leaders. They were provided with an empty graph. Time (in months) was displayed on the X-axis, and the Y-axis ranged from 1 to 10. School leaders were asked to rate the process of implementing DBDM in their school during the Focus-project with a score between 1 and 10. School leaders answered this question by plotting a storyline in the empty graph, starting at 'present' (thus, at the end of the project), and 'then' (at the beginning of the project), while thinking back to the start of the project, rating the various time points of the process by

giving grades between 1 and 10.

After they had plotted the storyline, school leaders were asked to elucidate their thoughts on the line they had drawn. This means that the school leader had to explain what caused a peak or fall of their line, what caused a change in direction, and what they think was successful or hindering. Additionally the interviewer asked which of the more general factors had promoted or hindered DBDM implementation (e.g. general collaboration within a school team versus poor teaching quality). The interviewer made notes during the interview and summarized the outcomes for each school. These notes and summaries were used for this study.

In addition, prior to their interviews with a school leader, trainers wrote down their own experiences per school in a report using the same storyline method. In this report they answered the same questions as the school leaders. These trainer reports were also used for this study. An example of a blanc story-line interview and an example of a storyline can be found in Appendix A.

4.5 Data analysis

The exploration of the factors that had influenced DBDM according to the experiences of the school leaders and trainers was guided by the three research questions. In order to answer these questions, the available data had to be analyzed. In the following section, the methods for these analyses will be elaborated on.

Interview data to answer the research questions

The data from the interviews were used to answer the three research questions and were strictly qualitative by nature.

All data was coded by means of ATLAS.ti.

To answer the first research question, four 'coding groups' were made, which were based on the findings from literature. These coding groups were: use of data as feedback, implementation process, participants' features, and organizational features. Subsequently, within each group, a distinction was made between hindering (-), and promoting (+). To explain how the coding was done, an example of a quote that was assigned to the category 'use of data as feedback':

Quote: "teachers experience graphics from Cito as an eye opener" → was coded as FB +.

The code FB means that it was assigned to the category 'use of data as feedback', and the (+) shows that it was experienced as a promoting factor. Within each category all coded data were further classified as a factor, which can be found in Figure 1. For example, within the category FB it meant that the quotes could be assigned to:

- *student monitoring system*
- *feedback on both individual and at class level*
- *frequent and longitudinal analysis*

To make sure that all factors that were mentioned by the respondents were analyzed, there was also a fifth category 'unknown'. All statements that did not fit in one of the four main categories were coded as 'unknown'. Within this category, quotes that were similar to each other were grouped together. This provided the opportunity to answer the second research question, which aimed to find new factors or a new category of factors.

Data of both respondent groups were coded the same way, which made it possible to compare the data of both groups.

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5. Results literature-based DBDM influencing factors

This chapter presents the results of the analysis of the coded data as described in the previous chapter. Every section describes the results of a category for both, the school leaders, and the trainers.

5.1 Use of data as feedback

The first category to be elaborated is the category 'use of data as feedback'. First the results of the analysis of the school leaders are described, followed by the results of the trainers.

5.1.1 Analysis school leaders

In total, 42 different school leaders, which are 43,8% of all interviewed school leaders, mentioned one or more features in the category 'use of data as feedback' as DBDM influencing factors. This means that 56,2% of the school leaders did not mention this category.

34,4% of all school leaders experienced this category as promoting and 16,7% mentioned hindering factors in this category. An overview of the results for the school leaders is presented in Table 5.

Table 5

Overview of school leaders' opinions in the category 'use of data as feedback'

	Promoting	Hindering	School leaders* (N=96)
Use of Data as Feedback	34,4	16,7	**43,8**
User- friendly digital SMS	18,8	16,7	**33,3**
Analysis of data on both individual and class level	1,0	0,0	**1,0**
Frequent and longitudinal data analysis	15,6	0,0	**15,6**

** The last column shows the total percentage of individuals that mentioned a specific factor. If a person mentioned a factor multiple times, for example both as promoting as well as hindering, this person was counted in the last column as one. This applies to all coming tables.*

5.1.1.1 Promoting factors by school leaders

In the category 'use of data as feedback', the most common promoting factor was 'user friendly SMS'. 18,8% of all school leaders mentioned this factor as promoting. School leaders explained that is was very useful to fill the SMS at the beginning of the project and that using the SMS gave them more insight into student results. Teachers at their schools learned more about the possibilities of the SMS and were positive about its clear and objective representations of student results, like schematic overviews and graphs. Teachers indicated that they learned how to use the system and are now more able to give meaning to these results.

'Analysis of data on both individual and class level' was mentioned by one percent of the school leaders. The school leader explained that data from parallel groups and sections is used to search for causes on student achievement. This means that the performance of analysis is not limited to individual level or class level, but also beyond class level.

The factor 'frequent and longitudinal data analysis was mentioned by 15,6% of the school leaders as promoting. Seven school leaders mentioned the added value of looking at the ability level of the students, which gave teachers extra insights into their student results and gave an extra impulse to them. Teachers learned to analyze student results in a different way. Other explanations were that teachers learned to analyze and look at the student results in a different way, for example analysis of student results over time.

5.1.1.2 Hindering factors by school leaders

School leaders mentioned one of the factors in this category as hindering. The factor 'user-friendly SMS' was mentioned by 16,7% of the school leaders. Eight times limitations of the system called 'Parnassys' were mentioned as hindering, and four times for the system 'ESIS'. Limitations were the impossibility to perform an analysis of specific errors that students make, and to upload and use the group plan formats in the system. They also explained that the SMS did not present the results in clear and easy-to understand formats causing uncertainties in what teachers were reading and how to interpret

data for the right group of students. Three school leaders mentioned the basic conditions to use the system were lacking: computers did not work, no access to the network, and the software of the SMS itself did not work. One school leader mentioned the transition to another SMS, which required teachers to adapt to the new software for example.

School leaders did not mention other hindering factors in this category.

5.1.2 Analysis Trainers

In total, the category 'use of data as feedback' was mentioned in 22,9% of the cases, which means that in 77,1% of the cases this category was not mentioned by the trainers.

In 19,8% of the cases factors of this category are mentioned as promoting and in 15,2% as hindering. An overview of the results of the trainers is presented in Table 6.

Table 6

Overview of trainers' opinions in the category 'use of data as feedback'

	Promoting	Hindering	% Trainers* (N=96)
Use of Data as Feedback	**26,0**	**5,2**	**30,2**
User- friendly digital SMS	19,8	5,2	**22,9**
Analysis of data on both individual and class level	0,0	0,0	**0,0**
Frequent and longitudinal data analysis	9,4	0,0	**9,4**

5.1.2.1 Promoting factors by trainers

Trainers mentioned the user-friendliness of the SMS in 19,8% of the cases. They mentioned that teachers gained more insight in the SMS and its possibilities. In two cased the trainers mentioned that their school used a program that filled protocols automatically, which was positively experienced by the complete school team.

The factor analysis on both individual and class level was not mentioned as a promoting factor.

Frequent and longitudinal analysis was mentioned in 9,4% of the cases. Trainers explained that, by using the ability score, the teachers created a more nuanced image of their students' achievements and progress.

5.1.2.1 Hindering factors by trainers

In 5,2% of the cases the extent to which a SMS was user-friendly was mentioned as hindering for DBDM. Examples of hindering issues were the malfunction of the system (Parnassys) or a server that was broken. Trainers also explained that it was not always clear to the school team how to work with the system and its format, which caused a lot of frustration in the team.

The other two factors 'analysis of data on both individual and class level' and 'frequent and longitudinal data analysis' were not mentioned as hindering by trainers.

5.2 Implementation process

The second category to be elaborated is the category 'implementation process'. First the results of the analysis of the school leaders are described, followed by the results for the trainers.

5.2.1 Analysis school leaders

This category was mentioned by 76% of the school leaders as a DBDM influencing factor. 62,5% of all school leaders mentioned promoting factors in this category and 41,7% of the school leaders mentioned hindering factors. It means that 24% of the school leaders did not mention any factor in this category as influencing DBDM.

An overview of the results for the school leaders is presented in Table 7. The next sections will elaborate the specific promoting and hindering factors mentioned by school leaders.

Table 7
Overview of school leaders' opinions in the category 'implementation process'

	Promoting	Hindering	% School leaders* (N=96)
Implementation process	**62,5**	**41,7**	**76,0**
Goals and expectations regarding student achievement and DBDM	29,2	7,3	**35,4**
Time	25,0	15,6	**33,3**
Data coach or trainer	32,3	25,0	**45,8**

5.2.1.1 Promoting factors by school leaders

The factor 'goals and expectations regarding student achievement and DBDM' was mentioned by 29,2% of the school leaders. Six school leaders mentioned that clarity of the goals had a positive influence on DBDM. Nine school leaders mentioned clear appointments as promoting. They explained that consensus about for example group plans, which describe the specific educational needs of each student, increased its quality. Clear agreements made sure that every team member was aware of its responsibilities and acted on this. Three school leaders mentioned that it was positive to have a plan or calendar that exactly states the time path of testing, analysis and evaluation.

The next factor 'time' was mentioned by 25% of the school leaders. The school leaders explained that the reservation of time to organize work moments had a positive influence. During these scheduled work moments teachers could analyze student results and discuss data with each other and work on group plans, which resulted in conversations and discussions about educational content that were more in-depth and useful. The facilitation of time stimulated the sharing of experiences and good practices.

The 'data coach or trainer' was mentioned by 32,3% of the school leaders. Ten school leaders only mentioned 'trainer' as a success factor and gave no further explanation. Six school leaders explained that it was positive to have direct contact with the trainer to have consultations about the needs of the school. Seven school leaders mentioned practical meetings that matched the needs of the school and concrete feedback as promoting factors. Five school leaders experienced the presence of a trainer as supportive and stimulating, which helped to stay focused on the implementation of DBDM in the school.

5.2.1.2 Hindering factors by school leaders

School leaders also mentioned the factor 'goals and expectations regarding student achievement and DBDM' as a hindering factor (7,3%). The school leaders explained that the lack of clear school appointments caused agitation and therefore stagnation of the process. There was no uniformity in the execution of tasks. The lack of goals made that the team had no idea what way to go and therefore the content of DBDM was not clear.

'Time' was mentioned by 15,6% of the school leaders as a hindering factor. Thirteen of them explained that there was insufficient time to write the group plans, which state the educational needs of the student and the plan of action to meet this needs. The time pressure also made that there was less control on the group plans and intermediate evaluations. One school leader explained that during meetings there was insufficient time to discuss the DBDM process, which caused a lack of interaction about agreements and sharing of experiences.

The factor 'data coach or trainer' was mentioned by 25% of the school leaders. Six school leaders experienced the level and pace of the training was too high, and that the amount of information was too large. This caused too much pressure on the teachers. Seventeen school leaders mentioned that the training had not been adapted to the situation of the school. Sometimes the training did not fit the agenda of the school or the assignments of the training did not fit the school's situation, which led to annoyance. Eleven school leaders mentioned some characteristics of the trainers as hindering. Examples that were given were a trainer who could not answer all the questions that teachers had, a change of trainers (5 school leaders), and insufficient support and guidance (4 school leaders). Other features that were mentioned by a few school leaders were the lack of insight into the content of the trajectory prior

to the training, and the impossibility to exchange experiences with other schools that implemented DBDM.

5.2.2 Analysis trainers

In total, the category 'implementation process' was mentioned in more than half of the cases, namely in 55,2% of all cases, which means that in 44,2% of the cases this category was not mentioned by the trainers. In 36,5% of the cases, factors in this category are mentioned as promoting and in 15,2% as hindering. An overview of the results of the trainers is presented in Table 8.

Table 8

Overview of analysis of trainers' opinions in the category 'implementation process'

	Promoting	Hindering	% Trainers* (N=96)
Implementation process	**36,5**	**35,4**	**55,2**
- Goals and expectations regarding student achievement and DBDM	20,8	14,6	**30,2**
- Time	16,7	9,4	**25,0**
- Data coach or trainer	9,4	16,7	**24,0**

5.2.2.1 Promoting factors by trainers

In this category the factor 'goals and expectations regarding student achievement and DBDM' was mentioned the most, namely in 20,8% of the cases. The trainers explained that in these cases the school team made clear appointments about how to fill in the process of DBDM within their school regarding analysis, evaluation and the transfer of student data. Strict appointments ensured uniformity of the group plan; the content, the lay out and the deadlines. Trainers also mentioned that the development of a 'test protocol', which stated the time path of specific tests, caused not only clarity on what can be expected from the teachers, but also on what teachers could expect from their school leader. This took away uncertainties from the school team and improved the fulfillment of appointments by school leaders and academic coaches.

The factor 'time' was mentioned in 16,7% of the cases as a promoting factor. Thirteen times the 'result oriented meeting' was mentioned as a success factor. During these meetings there was time to discuss student data and to think about actions to optimize the current working method. There was time to collaboratively analyze student results and to present results to each other. The meetings caused a feeling of shared responsibility and provided insight for every teacher into the performances of all students within their school. In the other cases, trainers mentioned work moments or a study day with time to perform collaborative analysis.

In 9,4% of the cases, the trainer was mentioned as a success factor. Explanations about which features of the trainers are indicating for success differ. Perseverance, presentation and a good listener are examples of features that are mentioned. In two cases it was experienced as positive when there was consultation about matching the content of the training to the school needs.

5.2.2.2 Hindering factors by trainers

Trainers mentioned in 14,6% of the cases features of 'goals and expectations regarding student achievement and DBDM' as hindering. Six of them mentioned a lack of uniformity as a hindering factor; few agreements were recorded and every teacher kept his own administration in his own way. Teachers find it difficult to adhere to the school appointments and are used to act in their own way. However, in some cases it was described that there was a lack of clear appointments or direction. One case indicated that teachers were so motivated by the Focus project, that they initiated small things regarding DBDM. This made that there were various small projects in school, without one continuous line or direction. Eight trainers mentioned that school teams had a lot of discussions that never ended. No decisions were made, which caused noise and made that not all persons did everything in the same way. The absence of clear goals and expectations were also visible in the lessons of the teachers. Multiple lessons were insufficient, however teachers were convinced that the lesson was good. This resulted in friction between the teachers, the academic coach and the trainer, and caused stagnation of the process.

Time was mentioned in 9,4% of the cases. Not every trainer gave an explanation different than the lack of time. Two trainers explained that there was too little time for the academic coach and the corresponding tasks. For the DBDM implementation process it meant that the academic coach had no time for classroom observations. Other examples that are given are that team members needed to schedule DBDM work moments themselves, and that teachers did not have enough time to make improvements based on the feedback they have received. Two trainers explain that the lack of time arises by introducing other subjects or the combination with other projects that are being implemented in school.

Features regarding the data coach were mentioned in 16,7% of the cases as hindering. In five cases having multiple trainers had a hindering effect. Why the schools had different trainers was not explained. In ten cases the content of the meetings did not match the needs of the schools. In a few cases the training was behind the development of the school regarding DBDM. Teachers already knew how to analyze data and therefore the training had no added value and felt like a waste of time. However, in most cases the level of the training was too high, which made that teachers could not keep up and caused a decrease in motivation. One trainer explained that it was important to have consultations with the school about the content in order to fit the level and needs of the school and its team.

5.3 Participant features

The third category to be elaborated is the category 'participants' features'. First the results of the analysis of the school leaders are described, followed by the results of the trainers.

5.3.1 Analysis school leaders

The category 'participants' features' was mentioned by 87,5% of all school leaders. In 78,1% of the cases this category was mentioned as a promoting and 42,7% as a hindering factor. In this category the teachers' features were mentioned most, namely by 83,3% of the school leaders. School leader features were mentioned by 39,6% of the school leaders. This means that 12,5% of the school leaders did not mention any feature in this category.

Table 9

Overview of school leaders' opinions in the category 'participants' features'

	Promoting	Hindering	% School leaders* (N=96)
Participants' features	**78,1**	**42,7**	**87,5**
School leaders	***27,1***	***15,6***	***39,6***
- Data literacy	4,2	2,1	**4,2**
- Instructional leadership	27,1	13,5	**37,5**
Teachers	***71,2***	***34,4***	***83,3***
- Data literacy	36,5	7,3	**40,6**
- DBDM teaching skills	25,0	11,5	**33,3**
- Attitude towards DBDM	42,7	24,0	**57,3**

5.3.1.1 Promoting factors by school leaders

Features school leaders

Four times data literacy of the school leader was mentioned as a factor for success. These school leaders knew how to analyze and interpret the data, and to translate this into goals that meet the school needs. The data literacy of the school leaders also resulted in effective meetings that were focused on educational content and not on irrelevant cases.

27,1% of the school leaders mentioned the feature 'instructional leadership' as promoting DBDM. Eight of them explained that a school leader who had a clear and stable direction during the entire process of DBDM was contributive to the success of the implementation of DBDM. Twelve school leaders emphasized the importance of a strong and decisive school leader or academic coach who expresses the importance of DBDM. These school leaders or academic coaches stated clear expectations regarding documents, like for example group plans and evaluations, and controlled whether every person committed to these. Four school leaders explained the importance of a school leader who supports the teachers by helping them with analysis or by guiding the team into the right direction.

Features teachers

The factor 'teachers' was mentioned by 71,2% of the school leaders as a promoting factor for DBDM.

36,5% of the school leaders mentioned improved data literacy of teachers as a factor for success. Teachers knew better how to analyze data and to critically look at data and to think about where growth can be achieved regarding student achievement. Eight school leaders mentioned that teachers learned to reflect on their own teaching behavior and linked the results of the analysis to the instruction and/or education that they provided.

25% of the school leaders mentioned the improvement of DBDM teaching skills as promoting. The analysis of student data and the definition of student achievement goals forced teachers to look at the learning progression, which is a guideline for teachers that states the content and knowledge that a student should have learned at the end of a particular grade. Seven school leaders explained that this resulted in teachers who had more insight into the educational content of the subjects. Six school leaders stated that teachers who worked in a more goal-oriented way were a promoting factor. Nine school leaders explained that improved class management skills of teachers had a positive influence on DBDM. Teachers designed their lessons and instruction based on the educational needs of the students and worked more adaptively.

The attitude of teachers is a feature that was mentioned by 42,7% of the school leaders. 27 school leaders mentioned that teachers changed their attitudes in a positive way. Teachers who understood the importance of DBDM and its benefits showed motivation, which had a positive influence on DBDM. Five school leaders mentioned that teachers did not show resistance towards DBDM, which had a positive influence on the implementation of DBDM. Twelve school leaders explained that it had a positive influence when teachers were intrinsically motivated and high ambitions. These teachers worked hard to succeed and showed active behavior. They were eager to learn and willing to improve themselves and had therefore a positive influence on DBDM. Three school leaders also mentioned teachers who were an example for others and who motivated others as a positive factor.

5.3.1.2 Hindering factors by school leaders

Features school leaders

Twice data literacy of the school leaders was mentioned as a hindering factor for DBDM. It seemed that school leaders did not have enough knowledge or skills regarding the analysis of data and they therefore could not guide the DBDM process in a way a school leader should. For example, the school leader could not answer questions that teachers had. Fourteen times school leaders mentioned the lack of instructional leadership as a hindering factor for DBDM. Eight of them explained that the lack of a clear direction led to stagnation of the DBDM implementation process. The school leaders or academic coaches did not state clear requirements regarding the DBDM process, which resulted in teachers who did not know what was expected from them and therefore felt lost. Other school leaders, who did state expectations, did not control whether anyone lived up to these. Two school leaders mentioned the lack of support for the teachers if one got stuck. These teachers did not see the benefit of DBDM and felt DBDM was just an administrative task. And one school leader mentioned their academic

coach as a hindering factor. This academic coach had too much influence, which resulted in teachers who did not get the chance to speak up.

Features teachers

34,4% of the school leaders mentioned features of the teacher as a hindering factor for DBDM. Data literacy was mentioned by 7,3% of the school leaders. Four school leaders explained that teachers lacked the required knowledge to analyze student data and to draw conclusions. Another feature that had a hindering effect was that teachers did not link student achievement results to their own teaching behavior but searched for explanations outside themselves, which was mentioned by three school leaders.

DBDM teaching skills was mentioned by 11,5% of the school leaders as hindering. There were a few weak teachers who lack the required skills to translate the group plan into their practice in class. They showed poor class management skills, which resulted in ineffective lesson time. Three school leaders mentioned that teachers have difficulties to differentiate and work in sub groups.

The last feature of teachers, the attitude, was mentioned by 24% of the school leaders. The school leaders explained that there was a lot of resistance at the beginning of the project. This resistance was caused by the assumption of teachers that DBDM would be a lot of extra work and teachers did not see the benefits of DBDM. Some of the teachers felt that they were outsiders, because in their opinion the project did not fit their classes.

5.3.2 Analysis trainers

Trainers mentioned the category 'participants' features' in 93,8% of all cases, which means that in 6,2% of the cases the trainers did not mention any feature. In 76% of the cases this category was mentioned as promoting and in 39,6% as hindering. School leaders' features were mentioned in 78,1% of the cases and teachers' features in 77,1% of the cases.

Table 10

Overview of trainers' opinions in the category 'participants' features'

	Promoting	Hindering	% Trainers* (N=96)
Participants' features	**76,0**	**60,4**	**93,8**
School leaders	***60,4***	***39,6***	***78,1***
- Data literacy	8,3	11,5	**17,7**
- Instructional leadership	55,2	30,2	**72,9**
Teachers	***57,3***	***40,6***	***77,1***
- Data literacy	18,8	2,1	**20,8**
- DBDM teaching skills	12,5	15,6	**28,1**
- Attitude towards DBDM	41,7	31,3	**64,6**

5.3.2.1 Promoting factors by trainers

Features school leader

Eight trainers mentioned data literacy as a factor promoting DBDM. Multiple times the knowledge of the school leader or academic coach is mentioned regarding data analysis, and also the understanding of the goal of DBDM was experienced as a positive influence on the process of DBDM in the school. School leaders who knew how to perform in-depth analysis were able to share the findings with the team and to ask critical questions, which resulted in effective meetings that were focused on student achievement.

In 55,2% of the cases, trainers mentioned 'instructional leadership' as a promoting factor. In 28 cases the trainers emphasized the importance of a motivated, stable school leader, mostly in combination with the academic coach, who had a clear vision on and norms towards DBDM that were also clear to the team. Trainers explained that these school leaders knew what their team needed and could therefore lead their team into the right direction. Eight trainers explained that the school leaders took into account

the needs of their team and implemented DBDM step-by-step. This resulted in teams who had a better idea of what was expected from them and which steps they needed to take next.

These teams felt more confident and were therefore more motivated to continue and to develop the DBDM implementation. Other aspects that were mentioned by the trainers were a school leader who knew to choose the right activities during meetings or intervision activities and school leaders who involved in their team during the process, by listening to their feedback and made adjustments when necessary. The last promoting aspect that was mentioned multiple times was that the school leader checked if, and made sure that, every one worked according to the arrangements agreed upon.

Features teachers

Trainers mentioned in 18,8% of the cases the 'data literacy' of teachers as a promoting factor. Teachers gained more insight into the results of their students and became more proficient in executing in-depth analyses. Teachers showed more constructive thinking about the results and about finding causes for striking or disappointing results. They also critically looked at the influence of their own teaching behavior.

'DBDM teaching skills' was mentioned as a factor in 12,5% of the cases. Eight trainers mentioned that the teachers in their schools had good teaching skills. Teachers showed that they improved their improvement issues that were discussed in the previous period of the project. Their lessons were of a good quality. Two trainers explained that the teachers had more insight into the learning progression and worked more goal-oriented. And two other trainers explained that the teachers who had good teaching skills and showed good quality lessons functioned as an example and were a stimulating factor during the project for other teachers.

In this category the 'attitude' of teachers was mentioned most as a promoting feature by the trainers, namely in 41,7% of the cases. They explained that teachers were motivated and aware of the importance of DBDM. Teachers were willing to learn, to work hard and were open for feedback. During the meetings of the Focus project teachers took this serious and showed full effort in these cases. Improvement issues were used as input for their further development.

5.3.2.2 Hindering factors by trainers

Features school leader

Data literacy of school leaders was in 11,5% of the cases mentioned as hindering. Four school leaders did not endorse the importance of data-use, which meant that these school leaders wanted to keep things the way they were. Six school leaders did not know how to perform analyses with help of the SMS. They therefore had no idea of how their students performed and were not looking for solutions to improve student achievement.

In 30,2% of the cases, trainers mentioned 'instructional leadership' as a hindering factor. Eight school leaders did not believe in the DBDM intervention and they therefore did not attend several meetings of the Focus-intervention. The negative attitude regarding DBDM had its repercussion on the motivation of the team, which resulted in the expression and discussion of critical thoughts about DBDM during DBDM-meetings instead of points for improvements. In thirteen cases the school leader was not a real leader; there was a lack of prevalence and there was no consensus about the implementation of DBDM. School leaders were not clear in their vision and norms and the school leaders did not state any consequences if one did not execute the school its stated norms. This resulted in teachers who did not conform themselves to the appointments that were made. School leaders found it difficult to critically look at the lessons of the teachers and to provide them with critical feedback. In other cases teachers were not mentored or supported by their school leader, which made teachers felt lost and overwhelmed by DBDM.

Features teachers

Two trainers mentioned data literacy as a hindering factor. Both trainers explained that the knowledge and skills to work on DBDM were lacking. Teachers did not know how to analyze student results, which resulted in having difficulties during the other stages of DBDM, like for example the writing of a group plan.

'DMDM teaching skills' were mentioned in 15,6% of the cases. In six cases teachers were inadequate and showed insufficient lessons. Six other trainers explained that teachers found it difficult

to work goal oriented and to state clear group plans. Teachers could not differentiate during their lessons. In two cases teachers had a problem with keeping order in their class, which resulted in classrooms where learning or teaching was not even happening. In most cases teachers found it difficult to reflect on their own teaching behavior and causes were searched in external factors.

In 31,3% of the cases trainers mentioned the 'attitude' of teachers as a hindering factor. In all cases teachers were negative, unmotivated and they showed a lot of resistance against the Focus project. They were not aware of the benefits of DBDM and assumed there was less attention for the pedagogical side of children. Two trainers explained that the negative attitude of teachers resulted in meetings that were used to express frustrations and to discuss DBDM instead of conducting analyses and improve student achievement. These negative teachers did not use the information that the Focus project provided and they affected other team members.

5.4 Organizational features

The last category of factors is the category 'organizational features'. First the results for the school leaders are described, followed by the results for the trainers.

5.4.1 Analysis school leaders

65,5% of the school leaders mentioned one or more factors in this category, which is more than half of the school leaders and means that 34,5% of the school leaders mentioned no factor in this category. The school leaders mentioned less hindering factors than promoting factors in the category organizational features. 62,5% of the school leaders mentioned a promoting factor in this category and 18,8% of the school leaders mentioned a hindering factor. The factor 'teachers' PD for DBDM' was not mentioned by one of the school leaders.

Table 11

Overview of school leaders' opinions in the category 'organizational features'

	Promoting	Hindering	% School leaders* (N=96)
Organizational features	**62,5**	**18,8**	**65,6**
Joint vision	18,8	6,3	**24,0**
School culture	38,5	7,3	**40,6**
DBDM collaboration	24,0	6,3	**28,1**
Teachers' PD for DBDM	0,0	0,0	**0,0**

5.4.1.1 Promoting factors by school leaders

'Joint vision' was mentioned by 19,8% of the school leaders. According to the school leaders uniformity was one of the contributing factors for success. A uniform vision on education made that all team members knew into which direction the school should go. Seven school leaders mentioned that the participation of the whole school team in the training caused wide involvement and uniformity, which resulted in a team that supported and shared the same vision on DBDM.

38,5% of the school leaders mentioned 'school culture' as a promoting factor for DBDM. The school leaders explained that an open culture, in which teachers felt that they matter, created a feeling of shared responsibility. This caused a school culture in which teachers shared experiences and good practices, they spoke with each other about student results and asked each other for help. Teachers gave each other feedback and were open to receive feedback. The culture was focused on student results and opportunities for improvement instead of problems. Success was celebrated with the whole team.

The third factor in this category, 'DBDM collaboration', was mentioned by 24% of the school leaders. The introduction and implementation of class visitations and observation days were experienced as factors for success. It arranged extra opportunities for teachers to learn from their colleagues, and linked the theory to practice.

5.4.1.2 Hindering factors by school leaders

'Joint vision' was mentioned by 6,3% of the school leaders as a hindering factor. Three school leaders explained that there was insufficient support from the team to work on DBDM, which was

caused by poor communication about the Focus-project and the merging of two schools. Another thing that was mentioned was that not the whole team was involved in the project.

7,3% of the school leaders mentioned the 'school culture' as a hindering factor. Three school leaders mentioned that teachers were afraid of feedback. They did not feel safe and assumed they were punished for the results. One school leader explained that teachers did not behave like professionals and felt personally attacked. Feeling unsafe caused stagnation in the process of DBDM.

'DBDM collaboration' was mentioned by 6,3% of the school leaders. In these cases the team did not operate as a team and plans were not specific and not executed in practice. One school leader explained that part-time jobs are sometimes hindering, because teachers work only two days and think that their colleague will take care of something like this. This causes a lot of pressure on the other colleagues.

5.4.2 Analysis trainers

Trainers mentioned in 58,3% of the cases one or more factors in the category 'organizational features, which means that in 41,2% of the cases the trainers did not mention any factor. The trainers mentioned more often promoting factors than hindering, namely in 40,6% mentioned of the cases promoting factors were mentioned and in 29,2% of the cases hindering factors.

Table 12

Overview of trainers' opinions in the category 'organizational features'

	Promoting	Hindering	% Trainers* (N=96)
Organizational features	**40,6**	**29,2**	**58,3**
Joint vision	17,7	14,6	**30,2**
School culture	14,6	13,5	**27,1**
DBDM collaboration	20,8	4,2	**25,0**
Teachers PD for DBDM	2,1	0,0	**2,1**

5.4.2.1 Promoting factors by trainers

In 17,7% of the cases the trainers mentioned the factor 'joint vision' as a promoting factor. Four trainers explained that it helped if the whole school team embraced the vision of the school to implement DBDM. Three trainers mentioned that the school made appointments on lifelong learning line within school. In eight cases trainers explained that it was contributive to the process of DBDM if the school made clear appointments about how their education should look like. For example clear agreements about which instruction model to be used, about the design of the lessons of specific subjects, and about class management made sure that there was uniformity of education within school. Four trainers explained that this uniformity and joint vision caused solidarity within school; teachers worked together on the same goal(s).

The culture of the school was mentioned in 14,6% of the cases. Four trainers explained that a safe and open culture was beneficial for DBDM. It stimulated teachers to share critical thoughts, ask questions and to discuss results with each other, which created a more professional culture. In this culture teachers listened to each other and were open to receive feedback, which they used to improve their practice. Four other trainers mentioned that a culture in which the ideas of teachers to improve the implementation of DBDM were listened to was a factor for success. In two cases the trainers mentioned that the celebration of success with the complete team contributed to DBDM.

Thirteen trainers mentioned the success of the organization of so-called 'observation days', which helped teachers to translate the group plan from theory into practice. These days also gave teachers practical tips to improve their education. Five trainers mentioned collaboration in general as a factor for success; it created a feeling of shared responsibility. Teachers worked together on group plans and helped and supported each other, which increased the quality of the group plans. Teachers experienced collaboration and collegial consultation as meaningful (mentioned by one trainer); it helped them to share experiences and good practices.

Two trainers said something about the personal development of teachers. They explained that it was promoting if there was consultation about the content of the meetings of the Focus project. Afterwards teachers could set and work on their personal development goals.

5.4.2.2 Hindering factors by trainers

In 14,6% of the cases the factor 'joint vision' was experienced as a hindering factor for DBDM. Four trainers mentioned that there was no clear policy, which made that everyone did things the way they thought was the best. Other trainers explained that there were different visions on education and more specific on DBDM. This led in two cases to the participation of incomplete teams during the Focus project. It also led to confusion when the school leader or academic coach had a vision that differed from the team's vision. In other cases a lot of time was spent on discussions and frustrations regarding DBDM instead of the process of DBDM itself.

The 'school culture' was mentioned in 13,5% of the cases. Nine trainers spoke about an unsafe culture. Teachers were reserved during meetings and were afraid to admit that they did not understand something. Therefore observations and collegial consultation were not implemented. Trainers also explained that the teams assumed they would be punished for the results. In five cases the teams had meetings in which there was a lot of discussion without any concrete plans. There was no learning culture; they showed passive behavior towards DBDM and expected to improve by itself. In few cases the teams lack high student achievement expectations or they did not state or work on their improvement points regarding DBDM. In two cases the school teams were negative about their school leader, which resulted in a lot of gossip behind the school leader's back and school leaders who did not have a strong connection with their team.

Four trainers mentioned DBDM-collaboration as a hindering factor. They explained that the collaboration between school leader and academic coach could be better. An example that was given is that the school leader lacked the skills to perform a solid data analysis with the help of the SMS whereas the academic coach knew how to do it. However, the academic coach did not teach the school leader how to do it. Collaboration regarding DBDM between teachers could also be improved. In one case the schools had two locations, which was an obstruction for teachers to collaborate. Trainers explained that younger teachers could learn from the experiences from older teachers and the other way around especially regarding computer skills.

No trainers mentioned the last factor 'teacher's PD for DBDM' as a hindering factor.

6. Results 'other' DBDM influencing factors

In this chapter the factors in the category 'other' are elaborated. First the factors found in the analysis of the school leaders' interviews are presented, followed by the factors found in the analysis of the trainers' interviews.

6.1 Analysis school leaders

Table 13 presents the factors that were found in the analysis of school leaders' interviews. Most factors that were found were mentioned as hindering, except for the factor 'results'. The factors will be explained one by one.

Table 13

Overview of school leaders' opinions regarding 'other' factors

	Promoting	Hindering	% School leaders* (N=96)
Factor:			
Workload	0,0	58,3	**58,3**
Results	36,5	11,5	**41,7**
School team	0,0	28,1	**28,1**
Computer skills	0,0	11,5	**11,5**
Level difference of teachers	0,0	6,3	**6,3**

Workload

The factor 'workload' was not mentioned as a promoting factor, however 58,3% of the school leaders mentioned workload as a hindering factor for DBDM. The school leaders explained that teachers experienced DBDM as a lot of administrational work. They had issues with the balance between what should be noted and what was actually executed in practice. Especially at the end of a period, when school reports needed to be written, the work pressure was experienced as high. This resulted in teachers a loss of motivation and caused resistance against the Focus project.

Results

'Results' was mentioned both as promoting as well as hindering for DBDM. In sum, 41,7% of all school leaders mentioned results as a DBDM influencing factor. Positive results were mentioned as a promoting factor by 36,5% of the school leaders. Good results made that teachers felt competent and that their hard work was rewarded, which caused a boost in the motivation of teachers to continue with DBDM.

Negative results were mentioned as a hindering factor by 11,5% of the school leaders. When the results were lower than teachers expected, teachers felt disappointed and thought that all their hard work had not been worth all the effort, which caused demotivation among the teachers.

School team

About 28% of the school leaders mentioned features that fit in the factor 'school team'. The collaboration with another school was experienced as hindering by ten of the school leaders. However, in which way it had been hindering was not explained.

Another feature, which was mentioned by nine school leaders as a hindering factor, was the discontinuity of the team. Maternity leave and illness caused problems in the teams. New teachers that entered the project halfway missed the basis for DBDM and needed to catch up, which was difficult for them and demanded more of teachers who had already been there from the beginning of the project.

Six school leaders mentioned the absence or leave of the school leader as a hindering factor, which had the same effect as when a teacher left or was ill; it caused agitation in the teams.

Computer skills

11,5% of the school leaders mentioned the computer skills of teachers as an influencing factor. However, it was only mentioned as a hindering factor. The school leaders gave no further explanation

of which computer skills were missing. One school leader was a little more specific and mentioned technical knowledge with respect to the use of computers.

Level difference of teachers

The difference in levels of the teachers was also mentioned as a hindering factor by 6,3% of the school leaders. Some teachers needed extra guidance. Two school leaders mentioned that teachers who lacked the required level, Higher Vocational Education, were fired. They added to that, that teachers should develop their professional attitude.

6.2 Analysis trainers

Table 14 presents the factors that were found in the analysis of the trainers' interviews. Two of the factors that were found were mentioned both as promoting as well as hindering. The other factors were only mentioned as hindering DBDM.

Table 14

Overview of trainers' opinions regarding 'other' factors

	Promoting	Hindering	% Trainers* (N=96)
Factor:			
Workload	0,0	36,5	**36,5**
Results	25,0	10,4	**32,3**
School team	25,0	52,1	**64,5**
Computer skills	0,0	11,5	**11,5**
Level difference of teachers	0,0	7,3	**7,3**
SLO meeting	0,0	10,4	**10,4**
Connection Kindergarten	0,0	12,5	**12,5**

Workload

Trainers mentioned the workload in 36,5% of the cases as a hindering factor. They explained that teachers felt there was a lot of pressure. In four cases teachers were sick for a longer period of time and fell out, which caused extra pressure on their colleagues. In two cases the formats of the group plans were to extensive and in two cases the implementation of DBDM for multiple subjects at the same time was overloading.

Results

Results were mentioned in 25% of the cases as a promoting factor for DBDM. Most of the time improved results, as a result of DBDM, were a confirmation for the school that the implementation of DBDM was a success. This motivated the team to continue and to further improve the implementation of DBDM, which meant the expansion of DBDM to other subjects.

In two cases trainers mentioned low results as a promoting factor for DBDM. They explained that the insufficient results forced the school to implement DBDM and to improve the education they provided.

However, in 10,4% of the cases, results were mentioned as a hindering factor. Disappointing results led to demotivation of the team; teachers worked hard and did not obtain the results they hoped for, which affected the teachers' believes in DBDM negatively.

In three cases, good results had a hindering effect on DBDM. In these cases the teachers did not feel the need to change or improve their education because their students performances were already sufficient.

School team

Trainers from 25% of the cases mentioned features of the school team as a promoting factor for DBDM. Most of the times they referred to the school teams. In half of these cases it was promoting when the school continued the Focus project separately from the other school they had started the project with. Three trainers explained that it was easier to focus on, and to adjust the Focus meetings to the specific needs of the individual schools. In the other cased the trainers explained that a small, close, and

stable team is promoting DBDM. Teams know each other and are informed on everything in school, which makes it easier to get to the core.

In 52,1% of the cases the trainers mentioned a feature of the school team as a hindering factor. In eight cases trainers mentioned that the collaboration with other schools worked in a hindering way; schools differed too much, which made it difficult to have effective and fitting Focus meetings. In other cases, school staff alterations caused agitation. Due to diseases, dismissal and the change of school leader the teams changed and new colleagues were appointed. These new colleagues entered the Focus project later and did not know all the facts or issues at the school. In a few cases the school leader was not replaced yet or there was a school leader who could not have full commitment because the school leader needed to guide multiple schools. A large school team was also mentioned as a hindering factor; communication was difficult then and there were a lot of opinions which caused much discussion.

Computer skills

'Computer skills' were only mentioned as a hindering factor. In 11,5% of the cases trainers experienced the limited computer skills of teachers as hindering. Teachers, most of the times older teachers, lacked the required computer skills and therefore the analysis of student results took a lot of time.

Level difference of teachers

In five percent of the cases there was a lot of difference in the learning capabilities of teachers. Weaker teachers influenced the level of the training and slowed the implementation of DBDM down. In the other two cases there was a second group of teachers who entered the Focus project later and lacked the required prior knowledge.

SLO meeting

In 10,7% of the cases a poor 'SLO meeting' was mentioned as a hindering factor. The qulity content of the meeting was experienced as poor and irrelevant, which had a negative influence on DBDM in school.

Connection Kindergarten

The lacking or insufficient connection of the Kindergarten was also mentioned as a hindering factor in 12,5% of the cases. Teachers of the Kindergarten classes did not have a starting point regarding student results and did not feel supported by the rest of the team or the Focus project. In some cases Kindergarten teachers stopped with the Focus project.

7. Conclusions and Discussion

The purpose of this study was to analyze influencing factors for DBDM in Dutch primary schools. Insight into the hindering and promoting factors may improve DBDM and therefore be a valuable contribution to education in the Netherlands, especially since DBDM is expected to have a positive influence on student achievement (Dutch Inspectorate of Education, 2010). Below, the results of this study are summarized and conclusions are drawn in section 7.1. In section 7.2 the results are discussed. The chapter ends with a discussion of the limitations of the study in 7.3, and with recommendations for future research in 7.4.

7.1 Conclusions

In chapter 2, four main categories of DBDM influencing factors, based on DBDM literature, were distinguished and presented in Figure 3. The results for these four DBDM influencing categories were presented in chapter 5 and are summarized in Figure 7.1. The following research questions guided this study:

1. Which of the factors that were found in the literature do school leaders and trainers experience as hindering or promoting factors for DBDM?
2. Do trainers and school leaders mention DBDM influencing factors that are not mentioned in the DBDM literature?
3. What similarities or discrepancies are there between trainers' and school leaders' experiences with respect to the factors that promote or hinder working on DBDM?

Since research question 3 is related to both research question 1 and 2, the conclusions for research questions 1 and 2 will be presented in combination with research question 3. This means that this section starts with the conclusion on research question 1 and 3, and the section ends with the conclusions on research question 2 and 3.

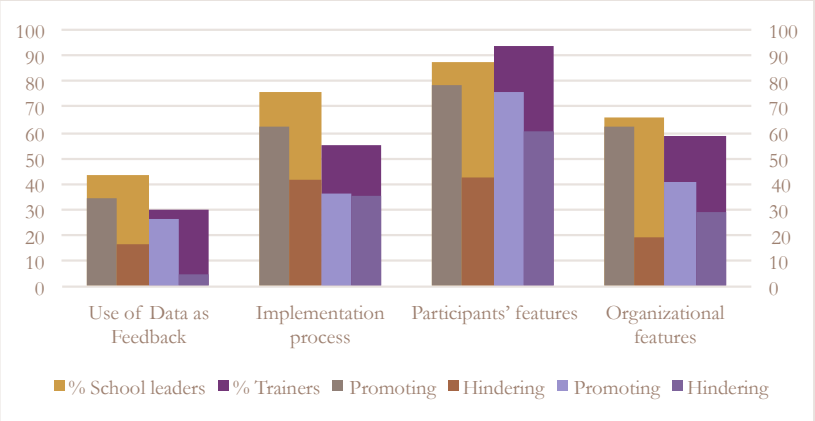

Figure 7.1. Known categories mentioned by school leaders and trainers

Conclusions for research question 1 and 3: Which of the factors that were found in the literature do school leaders and trainers experience as hindering or promoting factors for DBDM and are there similarities and discrepancies between their opinions?

Based on the opinions of school leaders and trainers it can be concluded that the category 'participants' features' is supposed to have had most influence on DBDM (Fig 7.1). Both, school leaders and trainers, mentioned factors in this category in respectively 87,5% and 93,8% of all the cases. Trainers and school leaders share the opinion that, in general, this category has a promoting effect on DBDM. However, they differ somewhat in their opinion on its hindering effect; in more than half of the cases (60,4%) trainers mentioned hindering factors in this category, compared with 42,7% of the school

leaders.

Figure 7.2a and 7.2b show more specifically the factors that were mentioned in this category. There is a discrepancy between school leaders and trainers regarding the supposed influence of the school leader (Fig. 7.2a). Trainers mentioned features of the school leader in 78,1% of the cases compared with 39,6% of the school leaders. The factor that is supposed to have the most influence in the category 'participants' features' is the factor 'instructional leadership'. The extent to which a school leader shows instructional leadership is supposed to have a positive influence when expectations and norms regarding DBDM, like for example deadlines, are clear to the team. The school leader also needs to check if everyone is executing their DBDM tasks in the way they should do this, and analyze if staff could use help. However, instructional leadership can also have a negative effect on DBDM, if the school leader does not show commitment to DBDM or is incapable to guide or support teachers in their DBDM development.

School leaders and trainers show similarities regarding the supposed influence of the factor 'teachers features' (Fig. 7.2b) by mentioning this factor in respectively 83,3% and 77,1% of the cases. The attitudes of teachers are supposed to have the most influence, both in a promoting as well as in a hindering way. Teachers who understand the value of DBDM are motivated and willing to learn. These teachers are active and are an example to other teachers. However, teachers who are unmotivated show resistance, which results in ineffective DBDM meetings and demotivated colleagues.

School leaders and trainers show a difference in their opinion about how promoting teachers' data literacy works. School leaders mentioned this factor in 36,5% of the cases compared with 18,8% of the trainers. However, both groups agree on how this factor works: the extent to which a teacher has sufficient data-literacy determines whether teachers are able to perform in-depth analyses of data and whether they have more insight into student results. They are also able to reflect on their own teaching behavior in relation to their students' achievements.

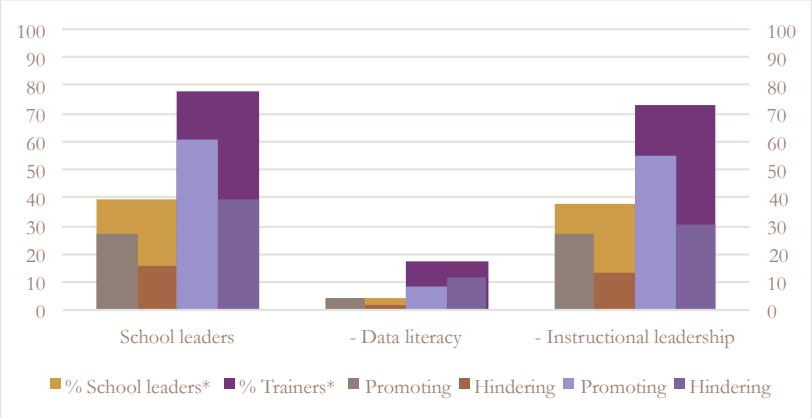

Figure 7.2a. Influencing features of school leaders mentioned by school leaders and trainers

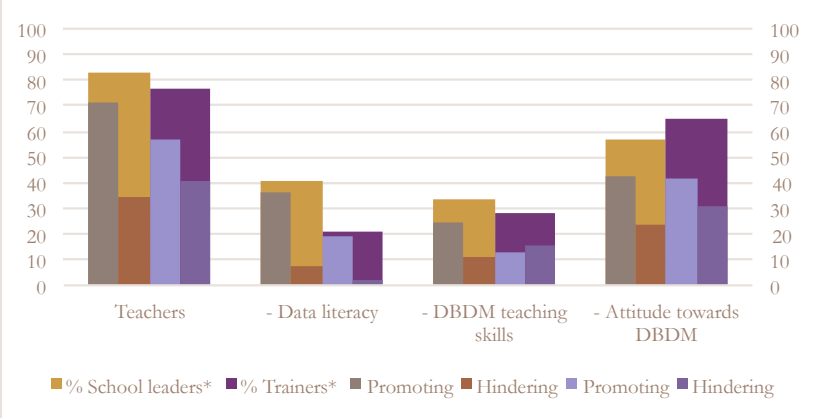

Figure 7.2b. Influencing features of teachers mentioned by school leaders and trainers

The next category, that is supposed to have had influence on the implementation of DBDM, is the category 'implementation process' (Fig 7.1). School leaders and trainers show a discrepancy on the supposed influence of this category by mentioning it in respectively 76% and 55,2% of the cases. School leaders differ from trainers in their opinion about the promoting effect this category is supposed to have had with respectively 62,5% against 36,5%. Figure 7.3 shows more specifically the factors that were mentioned in this category. There is no large difference in the supposed influence of the factors within this category. According to school leaders, the factor 'trainer' is supposed to have had most influence on the DBDM process in 45,8% of the cases. Trainers mentioned this factor in 24% of the cases. School leaders mentioned this factor more often (32,3%) as having a promoting impact than trainers did (9,4%) and emphasized the value of concrete feedback from the trainers that helped them improve. School leaders and trainers share the opinion that a training trajectory and/or a trainer who adapts the training and his support to the needs of schools promotes DBDM. They also show similarities with respect to its hindering influence with 25% and 16,7% of the cases. A training and/or a trainer who did not fit the needs of the school caused the most important hindering influence.

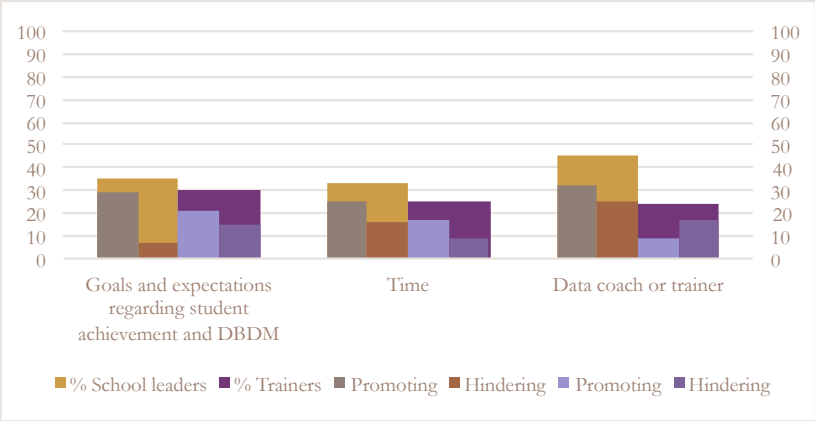

Figure 7.3. Factors in the category 'implementation process' mentioned by school leaders and trainers

School leaders and trainers show similarities in the supposed influence of the category 'organizational features' with respectively 65,6% and 58,3% (Fig. 7.1). However, school leaders were more positive about the supposed effect this factor has had by mentioning it in 62,5% of the cases as a promoting factor against 40,6% of the trainers who did so. They also mentioned this factor as less hindering with 18,8% against 29,2% of the trainers. Figure 7.4 shows the outcomes of the factors that were mentioned by school leaders and trainers in this category.

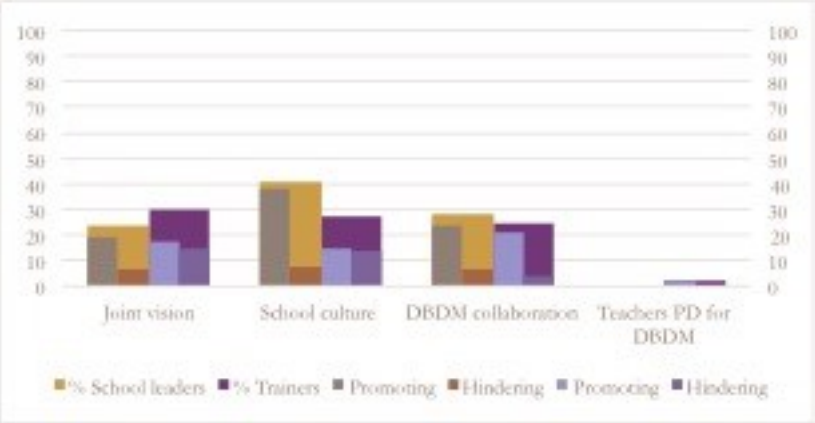

Figure 7.4. Factors in the category 'organizational features' mentioned by school leaders and trainers

The outcomes for both the school leaders as well as the trainers look quite similar. One significant difference is visible regarding the factor 'school culture'. According to 38,5% of the school leaders, the 'school culture' is supposed to have had a promoting influence on DBDM. However, trainers mentioned this factor as a promoting one in 14,6% of the cases. The degree of safety of a school culture

was supposed to determine its promoting or hindering effect; it determined whether or not teachers share experiences, ask questions, listen, and discuss results with reach other. This influences the extent to which teachers learn and DBDM improves.

The category that is supposed to have had the least influence, by both the school leaders (43,8%) and the trainers (30,2%), is the category 'use of data as feedback'. Figure 7.5 shows the results of factors in this category mentioned by school leaders and trainers.

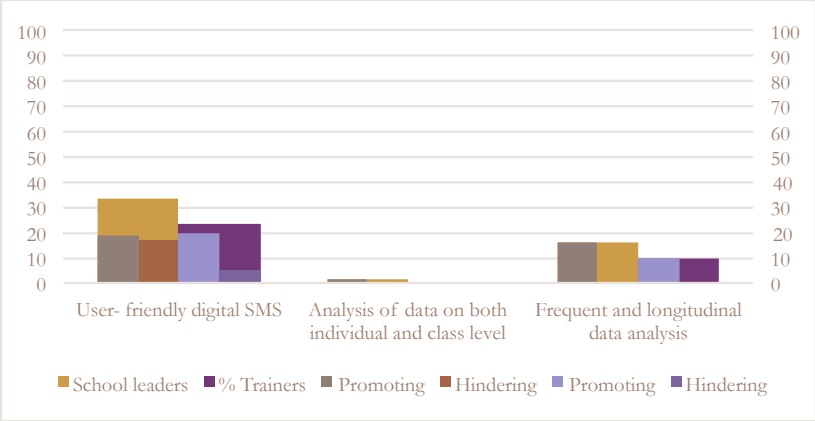

Figure 7.5. Factors in the category 'use of data as feedback' mentioned by school leaders and trainers

School leaders (16,7%) and trainers (5,2%) differ in their views on the magnitude of the supposed hindering effect that 'the user-friendliness of the digital SMS' had on DBDM. However, they agree on how this effect works: gaining insight into the possibilities of the student monitoring system and the analysis of the results of students over a longer period of time are experienced as a success factor. Limitations of the student monitoring system, like the integration of a different format or the unclear representations of results, are supposed to have had a hindering effect.

Research question 2 and 3: Do trainers and school leaders mention DBDM influencing factors that are not mentioned in the DBDM literature and are there similarities and discrepancies between their opinions?

School leaders and trainers both do mention factors that are supposed to have had influence on DBDM, which were not mentioned in the DBDM literature. Figure 7.6 shows the percentages of such factors that were mentioned by whom.

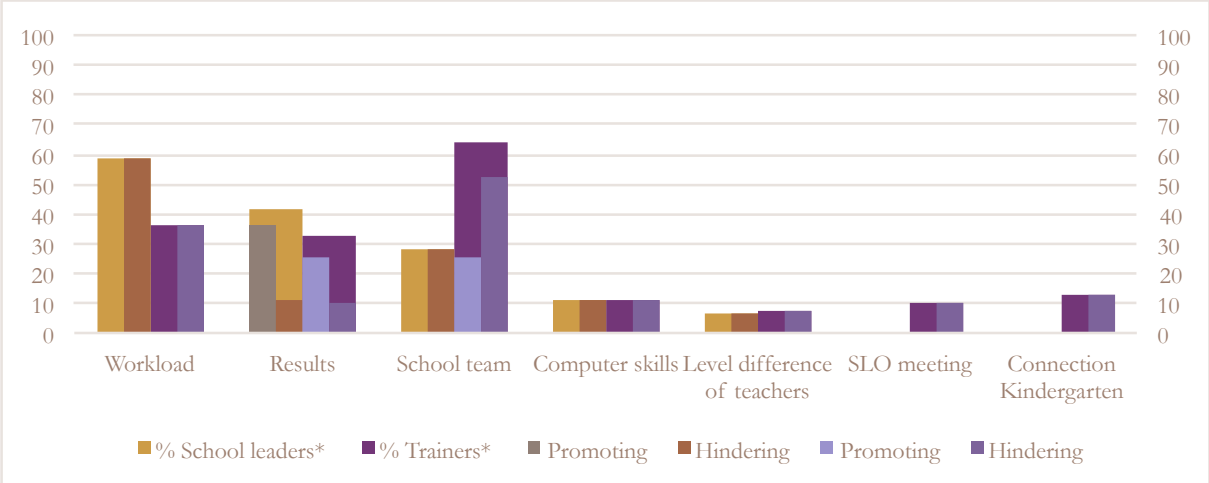

Figure 7.6. Factors mentioned by school leaders and trainers that were not found in literature

Three factors are supposed to have had considerable influence: workload, results, and school team. School leaders (58,3%) mentioned the factor 'workload' more than trainers (36,5%), however

both the school leaders and the trainers see workload as a hindering factor. DBDM required more clerical work, which caused pressure on teachers. Especially when DBDM was implemented for multiple subjects simultaneously.

Regarding the factor 'results' school leaders and trainers nearly present the same picture. Good results in terms of student achievement during the process of DBDM confirm the effectiveness of DBDM and motivate the teams to further improve DBDM. Disappointing results during DBDM caused demotivation and thus had a hindering effect. However, before the start of the project it worked the other way around. Poor results forced schools to improve their education and to implement DBDM, and good results did not stimulate teachers to further improve their education and thus to implement DBDM.

The third factor 'school team' was mentioned by 28,1% of the school leaders as hindering. However, trainers mentioned 'school team' in 64,5% of the cases as a DBDM influencing factor; in 25% of the cases this was considered to be a promoting, and 52,1% of the times a hindering factor. It seems that a stable school team promotes DBDM and that discontinuity in the school team hinders DBDM; new team members need to get used to the way the school works and are not at the same level of knowledge and skills as the other team members. The size of the school team has also effect on DBDM. A large team makes it more difficult to communicate, thus hinders DBDM, and a small team makes it easier to communicate and make appointments. And the last supposed hindering effect was the collaboration with other schools that differed in the extent to which they had already implemented DBDM. The Focus training did therefore not fit the needs of both schools due to these differences.

7.2 Discussion

This research identified factors that were supposed to have had influence on the implementation of DBDM in the eyes of school leaders and trainers. Insight into these factors may help to implement DBDM more effectively. In general, school leaders and trainers showed nearly the same picture with respect to the factors that were supposed to have had influence on DBDM. However, the perceived degree of influence of the factors differed sometimes. This could be caused by the position of both groups. School leaders need to reflect on their own organization and on their personal functioning and could therefore be more positive. Trainers watch the process from the outside, they are not part of the organization and don not have a personal connection with its employees. It could therefore be easier for them to have a more critical reflection on the organization and its processes within. However, trainers are not perfect themselves either. They do not have inside information about issues or processes within a school for example. Maybe there are good reasons for school staff to act in a certain way, reasons of which a trainer may not be aware. It may have a strengthened effect when the views of both groups are combined and used to improve DBDM within schools. The most important outcomes will now be discussed.

The outcomes of this study show that school leaders and teachers are supposed to be the most important players in influencing DBDM. However, trainers mentioned the instructional leadership of school leaders more than the school leaders themselves did. The different perspectives of trainers and school leaders could cause this difference. It is also possible that school leaders could have issues to reflect on their own role within their school. School leaders should be aware of their influence and of what they can do to positively affect DBDM in their school. Trainers could use this information to mentor the school leaders in their instructional leadership and to provide help, if necessary.

The attitudes of teachers are also supposed to have had influence on DBDM. Therefore it could be helpful for the implementation of DBDM to involve teachers in the process. This means that they should be asked for their view on hindering factors, about where they could use support, and about their assumptions regarding DBDM. When one has insight into their ideas and assumptions, one could improve the implementation of DBDM and influence their attitudes.

The research also shows that the workload played a role in the motivation of teachers. Therefore teachers should be supported to reduce the feeling of pressure which may influence the attitude of

teachers. The school leader himself or a data coach can provide this support. School leaders indicated that a data coach had a promoting effect on DBDM, which implicates that they appreciated the help of an external specialist. It is possible that school leaders, who indicated the data coach as a promoting factor, needed this help for themselves; to improve their data literacy or instructional leadership, for example. Therefore it could be helpful to indicate school leaders' expectations regarding the data coach. When the data coach knows what is expected, he can focus on these points and meet the needs of the school better. Trainers mentioned the 'data coach' mainly as a hindering factor, which was caused by previous data coaches who did not meet the needs of the schools and hence were replaced. Again, it shows that the data coach is aware of the needs of the school.

The student results of the schools should also be taken into account when implementing DBDM. The results are supposed to have had influence in two ways. First, it appeared that poor results led to the notion to improve education and a positive attitude regarding DBDM. It also worked the other way around. Therefore the starting point of the school should be taken into account to determine the strategy that should be taken and to estimate the beliefs of the teachers and school leaders. Next, the results during the implementation of DBDM also influence the attitude regarding DBDM. Positive results led to a positive attitude, and poor results to a negative attitude towards DBDM. Therefore it is important to mentor the school team not only based on results, but also on the process itself, which helps to find improvement points, to eventually improve the results.

Another important factor that needs attention, mostly emphasized by trainers, is the stability of the school team. It appeared that staff discontinuity had a hindering effect on DBDM, and the other way around. The school leader should be aware of this when implementing DBDM. When there are a lot of changes in the teams, the school leader should act on this by updating and supporting the new team members, and to provide extra support to them if necessary. In what way support is given and by who depends on the needs of the specific teacher. In case of a change of school leader, the academic coach could help the school leader out and inform him about the way the school worked during the period before his arrival.

The school leaders should also be aware of the communication in their team by monitoring if everybody knows what appointments were made and what is happening, especially in large teams. Communication is supposed to have had a hindering effect on DBDM in case of large teams.

Collaboration with other schools was also supposed to have had a hindering effect on DBDM. The reason for this was that the content of the Focus training did not meet both schools' needs, because the schools differed too much. To compare the effect of the Focus project between schools it was necessary to provide the same training to every school. Therefore, one could say that it was not the collaboration that hindered DBDM, but the training that did not fit.

Based on the results, future interventions should start with a meeting in which the complete school team is involved, which means that teachers, school leaders and academic coaches are involved. During this meeting all parties, which also includes the trainer, can explain their thoughts about the current DBDM process in their school, expectations with regard to the intervention, and special needs in terms of DBDM support or information. The meeting creates an opportunity for the trainer to get an idea of the teams' assumptions regarding DBDM and what the training should look like. The trainer can also explain which are the general key issues when implementing DBDM and what is needed to successfully implement DBDM. The goal of the meeting is to find a way to execute an intervention that is optimally adapted to the school's situation, and that is workable for both the trainer, as well as the school team. Prior to this meeting, the trainer should have insight into the student results at school to get an idea of what the starting situation of the school is, so (s)he can use this information when starting the conversation with the school team and evaluate if their assumptions are realistic and contribute to DBDM. Teachers feel involved, which has a positive effect on their attitude. And the trainer has the opportunity to steer the process into the right direction and to get everybody at the same line. To avoid

the hindering effect of collaboration with another school that has different needs, the training should only focus at one school so every school gets a training that is specific and adapted to their needs. To stimulate future collaboration a few meetings could be organized in which schools share good practices. In this way the content of the regular meetings is adapted to the school's needs and during the collective meetings schools could learn from each other and select examples that they can use within their school. The intervention should also pay attention to the stability of the school team and include a plan, to make sure that new team members are updated and can function at the same DBDM level as soon as possible.

7.3 Limitations of the study

One limitation of this study is that the data that was used were quite subjective. People, in this case school leaders and trainers, could easily forget to mention important things. The interviews were conducted at the end of the Focus project, which was after two years. One was asked to reflect on a time path of two years, which made that it could be possible that school leaders or trainers did not exactly remember which issues played a role during that time.

Next to this, the data used for this study was already collected and could therefore not be extended; there was no possibility to ask for further explanations about answers that were given. The interview data was also analyzed by one person, which may have influenced the interpretation of the data.

Another limitation is that this study did not use the opinions of the teachers who participated the Focus project. Teachers are the key figures within schools and do undoubtedly have an opinion about DBDM, its implementation, and its hindering and promoting factors. Their opinions provide a view from an extra angle and could therefore give valuable information to further improve DBDM within school.

This research did not include a measurement of if DBDM, and which element(s) of DBDM, was/were implemented successfully or not. It was therefore not possible to state exactly how strong the influence of a factor was and on which element of DBDM.

The research provides insight in hindering and promoting factors on DBDM. However, the study only focused on Dutch primary schools and cannot not be generalized to secondary schools.

7.4 Recommendations for future research

For future research one recommendation could be to reflect on the DBDM process multiple times during the intervention instead of only at the end. One could for example reflect on the previous period every quartile, which makes the data more actual and as a result possibly more accurate.

Another recommendation is to involve teachers in the research for two reasons. The first reason is that teachers are, together with school leaders, the persons that execute DBDM in their school. It is therefore interesting to involve their opinions, which also provides a reflection from a different angle. The other reason is that it appeared that teachers have influence on DBDM. A frequent reflection on the DBDM process with its executors and influencers could have an immediate positive effect on DBDM and/or its intervention.

The last recommendation for future research is to investigate how schools who differ in the extent to which DBDM was implemented successfully vary in their opinions about which factors matter for DBDM. It could be interesting to see if there is a difference in outcomes about influencing factors between schools that successfully implemented DBDM, schools that less effectively implemented DBDM, and schools that failed to implement DBDM. To determine to what extent schools succeeded in implementing DBDM, one can gain insight in this, by measurements or observations, in which aspects of DBDM are actually implemented at class level and at school level. Comparing data from different schools about these aspects provides insight into which elements are more difficult to implement and

which are more easy. One then could also focus on which factors are influencing which elements of DBDM and to what extent.

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Appendix A Blanc interview storyline method & example of a storyline

School	
Traject	
Date conversation	
Present (function)	

Peaks	Decrease
Stagnation	Change in direction
Succes factors	Barriers

DBDM in the school

Start in the present, mark the moments that were crucial, draw the line back. What caused the peaks, decreases, change of direction, stagnation…? What are success factors and what are the barriers?